ENGINEERING NEWS-RECORD

SEPT. 21, 1961

PRICE 50 CENTS

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Costs Roundup and Outlook

MATERIAL & EQUIPMENT
4TH
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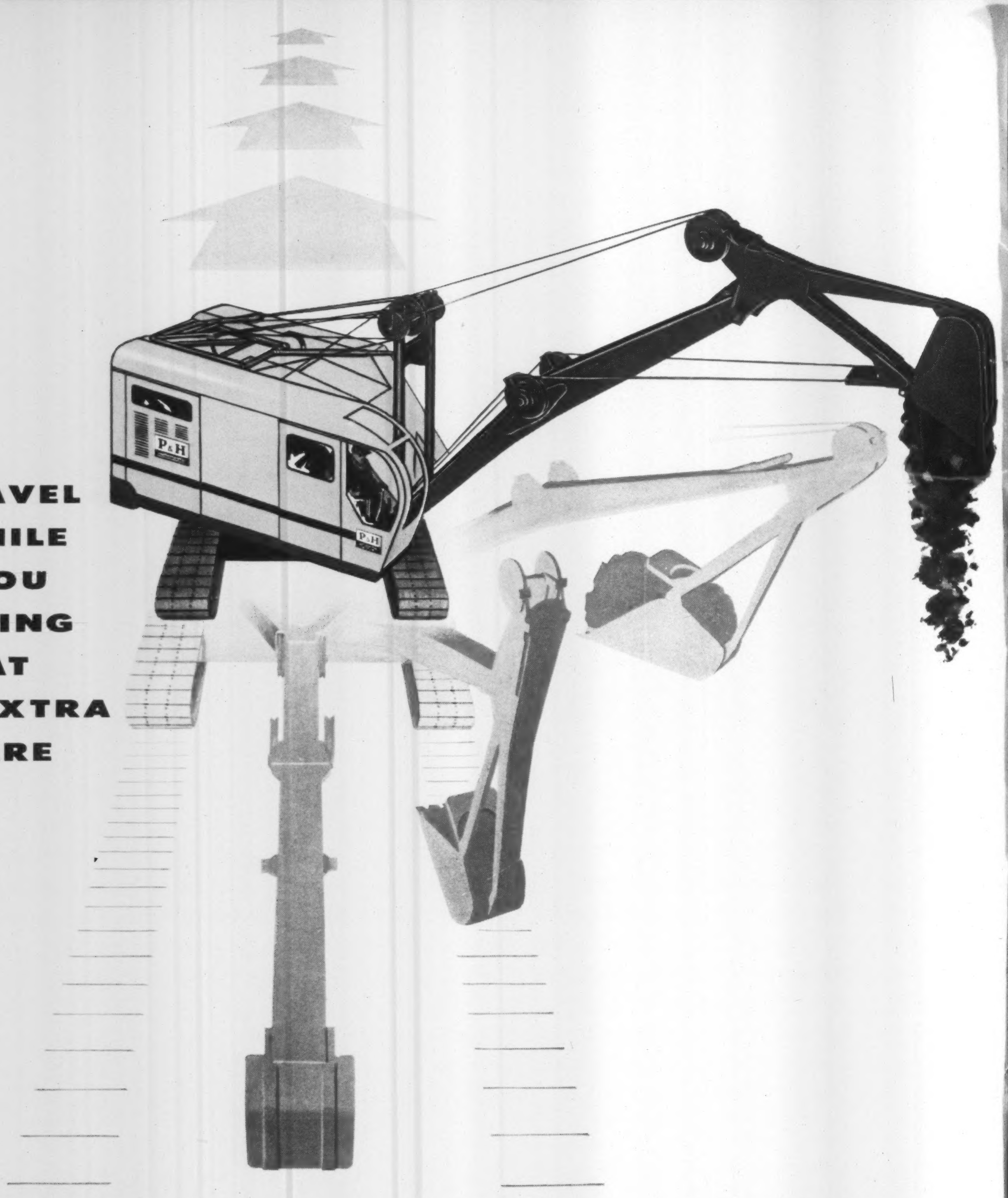

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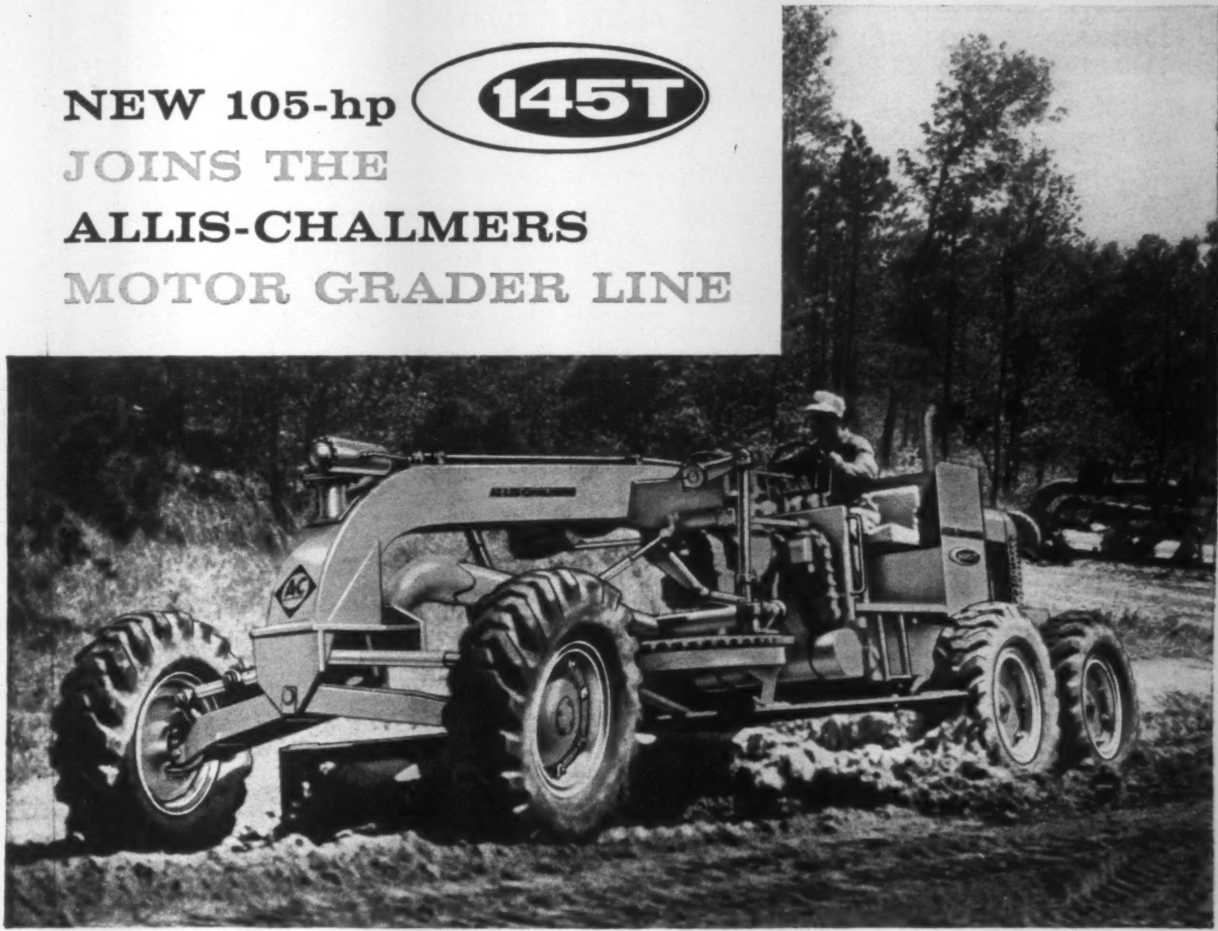

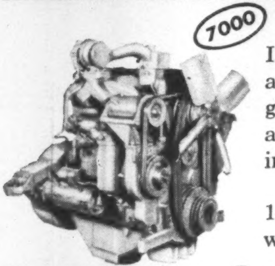

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EIGHTY SEVENTH YEAR OF PUBLICATION
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ENGINEERING NEWS-RECORD Vol. 167, No. 12, SEPTEMBER 21, 1961

Published weekly by McGraw-Hill Publishing Company, James H. McGraw (1860-1948), Founder. Printed at Albany 1, N. Y. See panel below for directions regarding subscriptions or change in address. **Executive, Editorial, Advertising and Circulation Offices: McGraw-Hill Building, 330 W. 42nd St., New York 36, N. Y.** OFFICERS OF THE PUBLICATIONS DIVISION: Nelson L. Bond, President; Shelton Fisher, Wallace F. Traendly, Senior Vice Presidents; John R. Callaham, Vice President and Editorial Director; Joseph H. Allen, Vice President and Director of Advertising Sales; A. R. Venezian, Vice President and Circulation Coordinator; Daniel F. Crowley, Vice President and Controller. OFFICERS OF THE CORPORATION: Donald C. McGraw, President; Hugh J. Kelly, Harry L. Waddell, Executive Vice Presidents; L. Keith Goodrich, Executive Vice President and Treasurer; John J. Cooke, Vice President and Secretary. **Subscriptions are solicited only from persons with identifiable commercial or professional interests in construction and building. Position and company connection must be indicated on subscription orders. Publisher reserves the right to refuse unqualified subscription.** United States subscription rate for individuals in the field of this publication $6.00 per year, single copies 50 cents; foreign $20 per year, payable in advance. Second-Class mail postage paid at Albany, N. Y. Printed in U.S.A. Title® registered in U.S. Patent Office. ©Copyright 1961 by McGraw-Hill Publishing Co., Inc. All rights Reserved. **UNCONDITIONAL GUARANTEE:** Our primary aim is to provide subscribers with a useful and valuable publication. Your comments and suggestions for improvements are encouraged and will be most welcome. The publisher, upon written request, agrees to refund the part of the subscription price applying to the remaining unfilled portion of the subscription—if editorial service is unsatisfactory.

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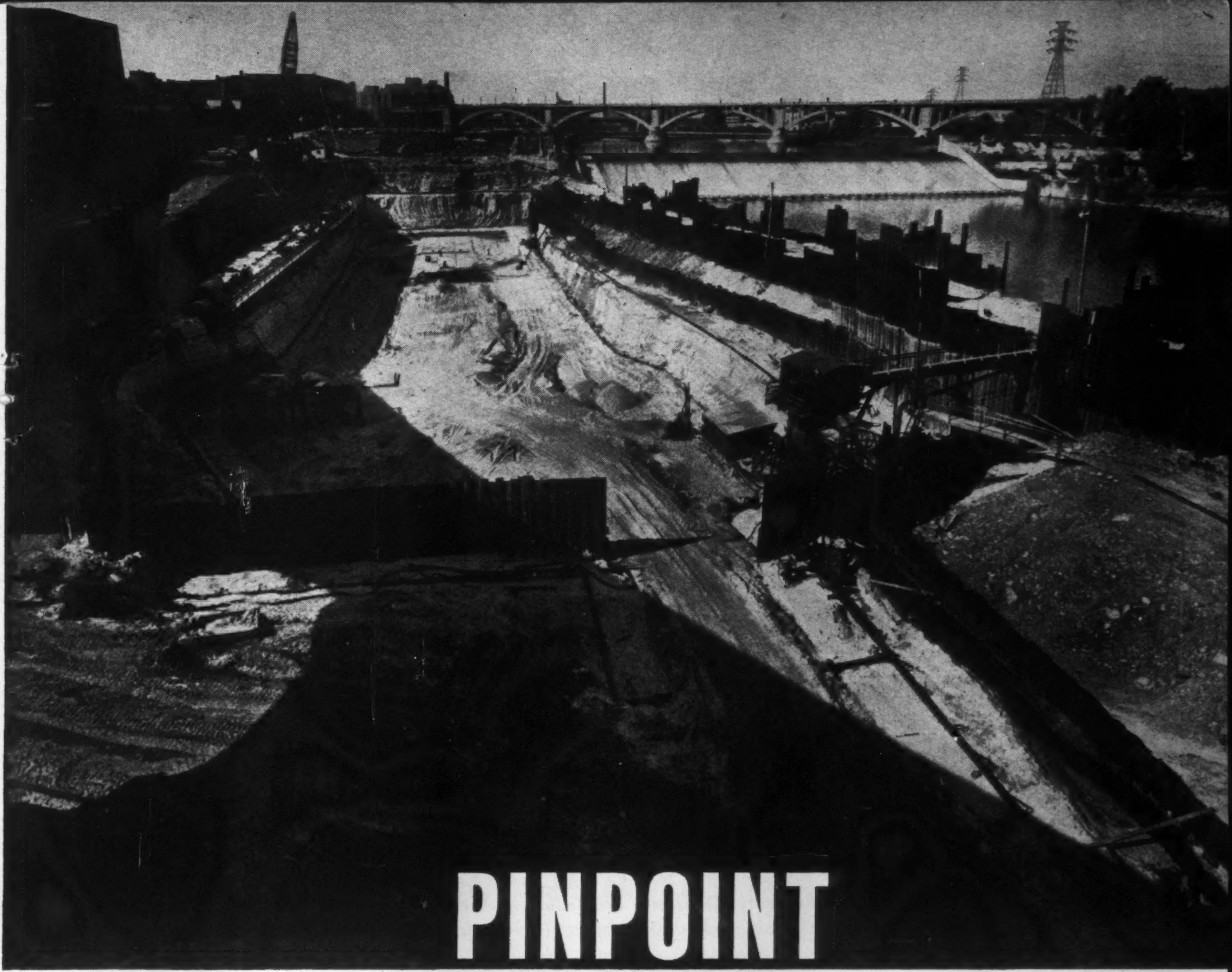

PINPOINT WATER CONTROL

61-3

There was a river next door to this excavation, the mighty Mississippi—but you'd never have known it by looking for ground water or seepage. Working in the difficult medium of soft, friable St. Peter's formation, a Stang engineered and designed dewatering system kept the entire working area of this exacting project water-free, the vertical slopes strong and firm. Involving wellpoints, sumping, and jetting operations, the efficient Stang dewatering system gave the contractor complete, flexible water control, in spite of the immediately adjacent river. Solutions to dewatering problems such as this are the specialty of Stang; through proper engineering analysis and design, Stang dewatering specialists continually save contractors time, money and trouble. Call Stang—there can be a qualified dewatering engineer on your jobsite tomorrow.

This project, the upper lock of the St. Anthony Falls Locks in Minneapolis, Minnesota, is only one of many interesting dewatering jobs described in the new 52-page Stang general catalog. Write for your free copy now.

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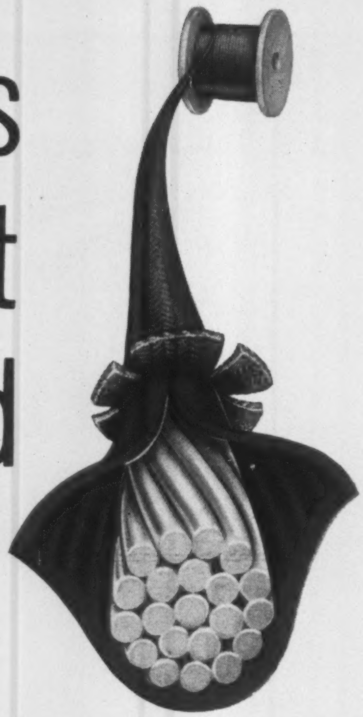

General Electric silicone rubber insulation protects against heat, overloads, ozone, aging, moisture and radiation

Double Capacity, Overload Protection — When used to insulate cable, silicone rubber gives you up to *twice* the current capacity, *twice* the overload protection as ordinary insulation. The superior electrical properties and wide operating temperature range of silicone rubber are the reasons.

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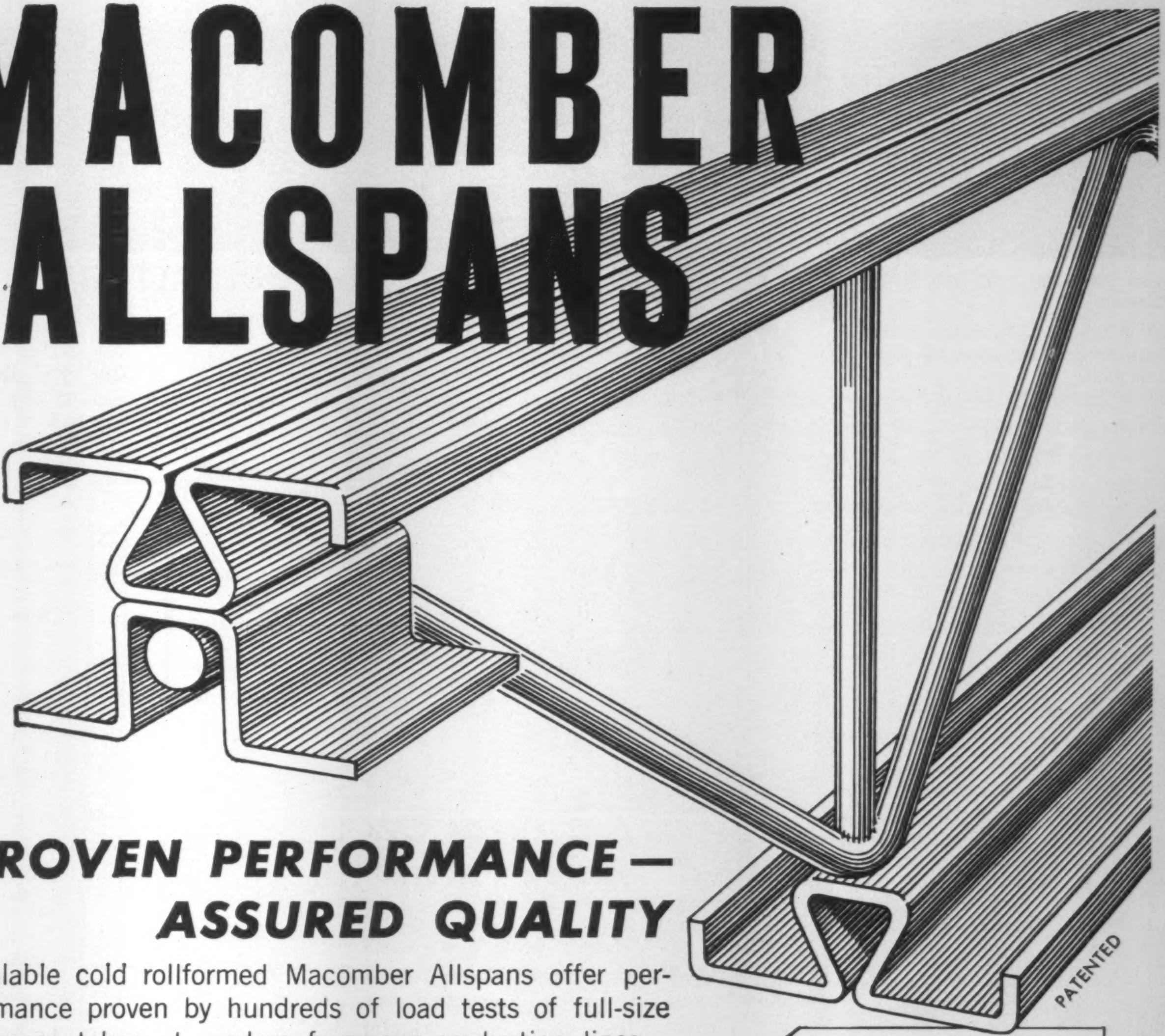
Get the full story on cable's best friend: silicone rubber. Write: General Electric Company, Silicone Products Dept., Section YY960, Waterford, New York.

GENERAL ELECTRIC

MACOMBER ALLSPANS



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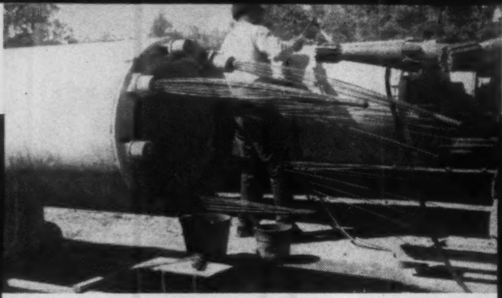
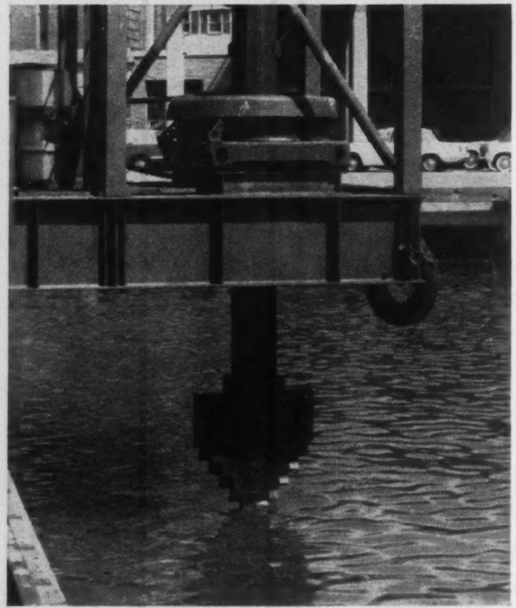


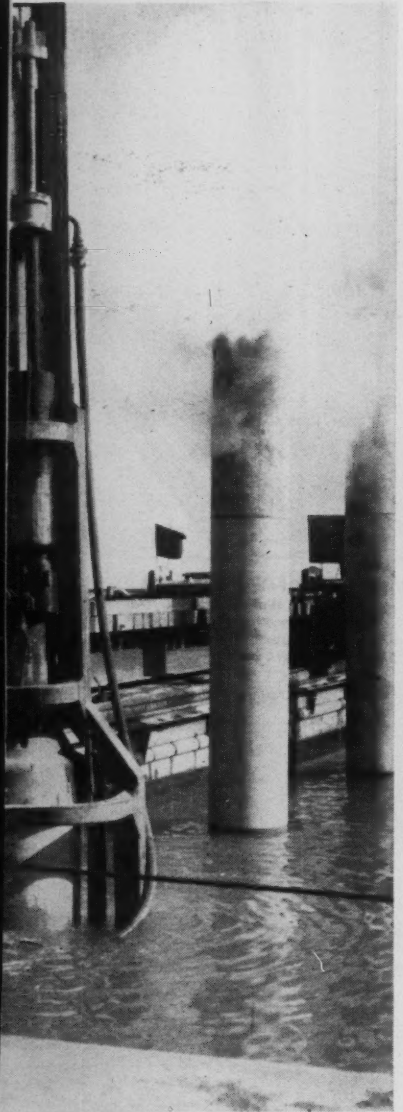
1. Stressing piles for the project at yard in Beloit, Ill.

[redacted]

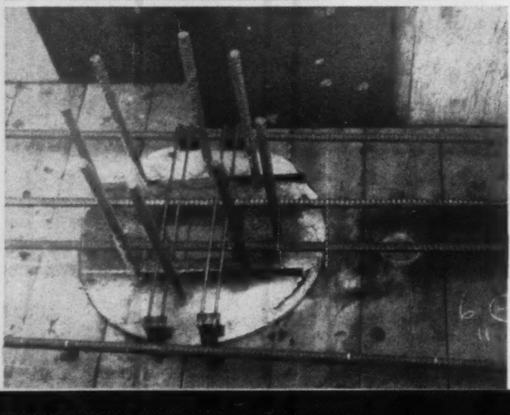
2. Frogmen are called in for lake bottom examination.



3. Rotary drill with 35″-diameter fishtail bit, used for pre-excavation for placement of piles.



4. After pre-excavating, piles are then driven to prescribed bearing depth.

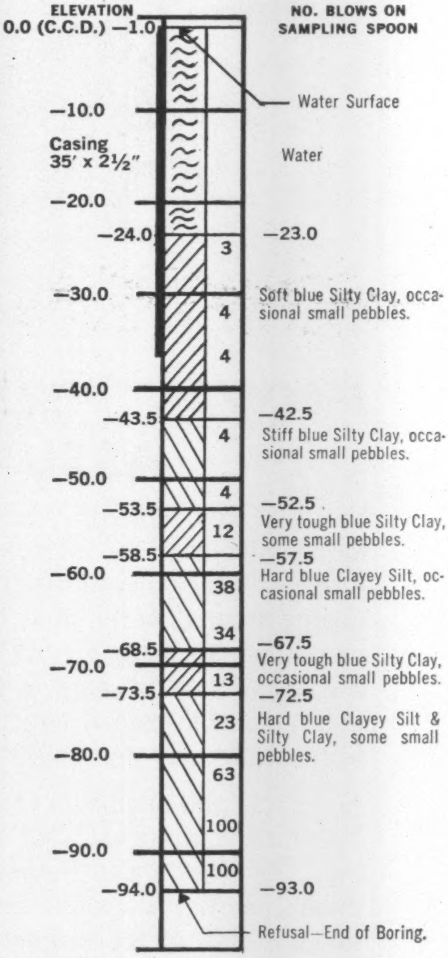


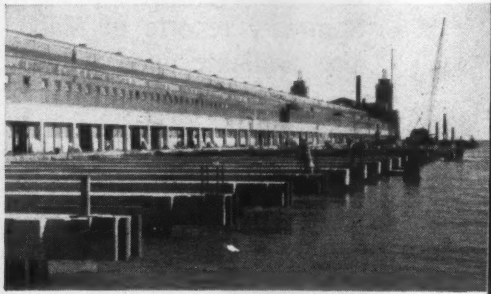
5. Plugged pile with dowels in place to receive cap and prestressed, precast deck.

CLIENT: City of Chicago, Ill. ENGINEER: Department of Public Works, Bureau of Engineering. PRIME CONTRACTOR:

[redacted]

Chart of soil boring indicates many non-supporting layers of silty clay to depth of below lake level of approximately 73.5 feet.


ELEVATION
0.0 (C.C.D.) −1.0
NO. BLOWS ON SAMPLING SPOON
Water Surface
−10.0
Casing 35′ x 2½″
Water
−20.0
−24.0
−23.0
3
−30.0
Soft blue Silty Clay, occasional small pebbles.
4
4
−40.0
−43.5
−42.5
4
Stiff blue Silty Clay, occasional small pebbles.
−50.0
4
−53.5
−52.5
12
Very tough blue Silty Clay, some small pebbles.
−58.5
−57.5
−60.0
Hard blue Clayey Silt, occasional small pebbles.
38
34
−68.5
−67.5
−70.0
Very tough blue Silty Clay, occasional small pebbles.
13
−73.5
−72.5
23
Hard blue Clayey Silt & Silty Clay, some small pebbles.
−80.0
63
100
−90.0
100
−94.0
−93.0
Refusal—End of Boring.



6. Caps ready for placement of precast deck.

Chicago Pier project shows advantages of RAYMOND Prestressed Concrete Cylinder Piles...

THE PROJECT

A 1247-foot long, 96-foot wide extension on the south side of Chicago's Navy Pier. It is used for general cargo operations and accommodates vessels of ocean-going size. Precast, prestressed deck rests on 318, 36″ diameter Raymond prestressed concrete cylinder piles, averaging 77 feet in length. Pile tops have cast-in-place concrete plugs with reinforcing dowels, with the remainder of the pile being hollow. Unusual subsoil conditions, disclosed by soil borings, dictated a pre-excavation technique (pioneered by Raymond) to a depth within a few feet of ultimate penetration. Piles were then driven by single-acting steam hammer to ultimate bearing depth. The pier supports two railroad tracks and has provisions for trucking and warehousing.

Advantages of Raymond Cylinder Piles

SPEED

The entire project, including soil investigations, was completed in *one shipping season,* a vital saving of time for such a busy port as Chicago. Piles were spun and stressed in nearby Beloit and trucked rapidly to the jobsite.

ECONOMY

Raymond Prestressed Concrete Cylinder Piles offer an unusually high load-carrying capacity foundation for their size and weight—without the extensive, expensive underwater work needed for caissons of a comparable capacity. Also, these piles are mass-produced, with the resultant savings that the process implies. And maintenance costs are next to nothing.

DURABILITY

This all-concrete pier has great bearing capacity (piles rated at 230 tons, tested to 345 tons), and is highly resistant to weathering, free of corrosion, and of course, fireproof. An expendable, inexpensive combination wood and rubber fender system at dockside protects both pier and ship.

WHY SPEED COUNTS

Since the opening of the St. Lawrence Seaway, Great Lakes cities are now deep-water ports, open to worldwide shipping. Loading and docking space has seldom kept pace with these potential capacities. With Raymond prestressed concrete cylinder piles, these facilities can be completed in record time. And the port with the best dockage will benefit first, with greater income.

PLUS . .

Other successful applications for these piles have been on causeways, bridges, offshore drilling platforms, highway overpasses, wharves, breakwaters, and transmission towers. If the advantages described here could apply to any of your projects, send for illustrated brochure CP-3, which gives the story of the Raymond prestressed concrete cylinder pile in full detail. Or give us a call; our engineers will be happy to consult with you.

7. Preparing to pour final deck topping.

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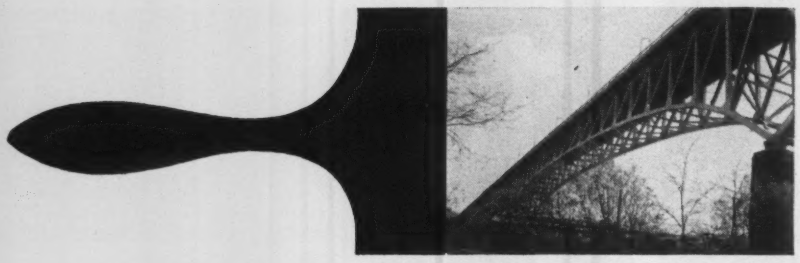

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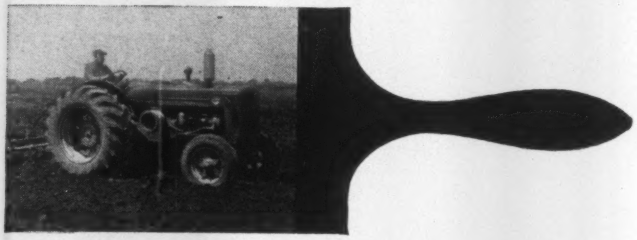

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Suggested formulations are available for a wide variety of these anti-corrosive and decorative paints designed for specific needs. We welcome inquiries and are prompt to respond.

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It takes a big schedule to keep this one busy!

Extra power does make a difference—and the "2010" has it! Fifty engine horsepower pays benefits on jobs from trenching and loading to landscaping—provides fast moves from job to job. Power steering boosts performance at the gravel pit and on busy city streets. Low-profile design adds stability to improve backhoe work, speed excavating, material handling jobs.

Constant-mesh transmission provides eight speeds forward, three reverse, to handle the wide variety of power-matched equipment offered.

Center-mounted and offset-digging backhoes operate with two-lever control. Heavy-duty loader has single operating lever for lift arms and bucket, which is self-leveling. Landscape equipment includes rear blades, scarifier-scraper, rake, and combination fertilizer-seeder. Sideboom with hydraulic counterweights is also available for gas, water, and other utility construction work.

For detailed specifications on new John Deere "2010" Wheel Loaders and equipment, and a demonstration on your job, contact your John Deere dealer through the classified telephone directory. John Deere, 3300 River Drive, Moline, Illinois.

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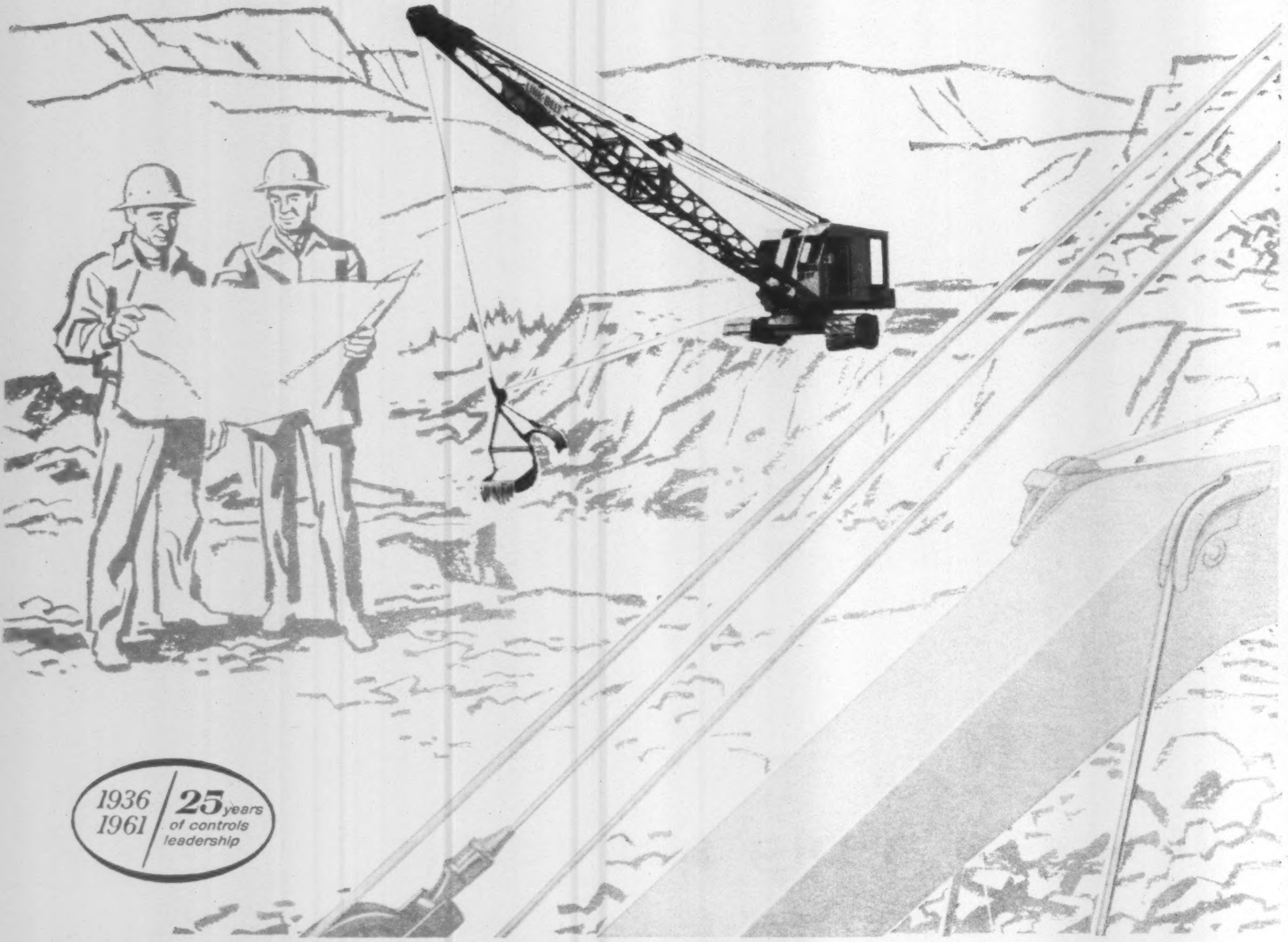


① **Full-Function Design practically doubles upper machinery life.** Separate shafts . . . separate gears . . . separate clutches transmit power for *each* machine function. Only the components in actual use are under load . . . other shafts and clutches remain motionless while gears run free on antifriction bearings. Full-Function Design has been proved in the field year after year to be superior to conventional design.

② **Speed-o-Matic power-hydraulic controls reduce downtime!** In addition to eliminating up to 150 mechanical parts, the Speed-o-Matic system is unaffected by normal changes in climate or temperature. Only a seasonal oil change is required . . . no need to prime or bleed the system.

③ **Speed-o-Matic clutches require little operator attention!** Hydraulic cylinder pistons automatically compensate for normal lining wear, heat expansion or weather changes. Minor adjustments may be weeks, even months apart.

④ **Clutches are interchangeable** on a given machine (including components of each) for reduced parts inventory. Located *outside* the side housings, clutches are readily accessible . . . can be easily pulled.

⑤ **Extremely short drum shafts minimize bending and flex!** Tandem drum arrangement allows closer spacing of the side housings and the side housing bearings, resulting in more rigid supports.

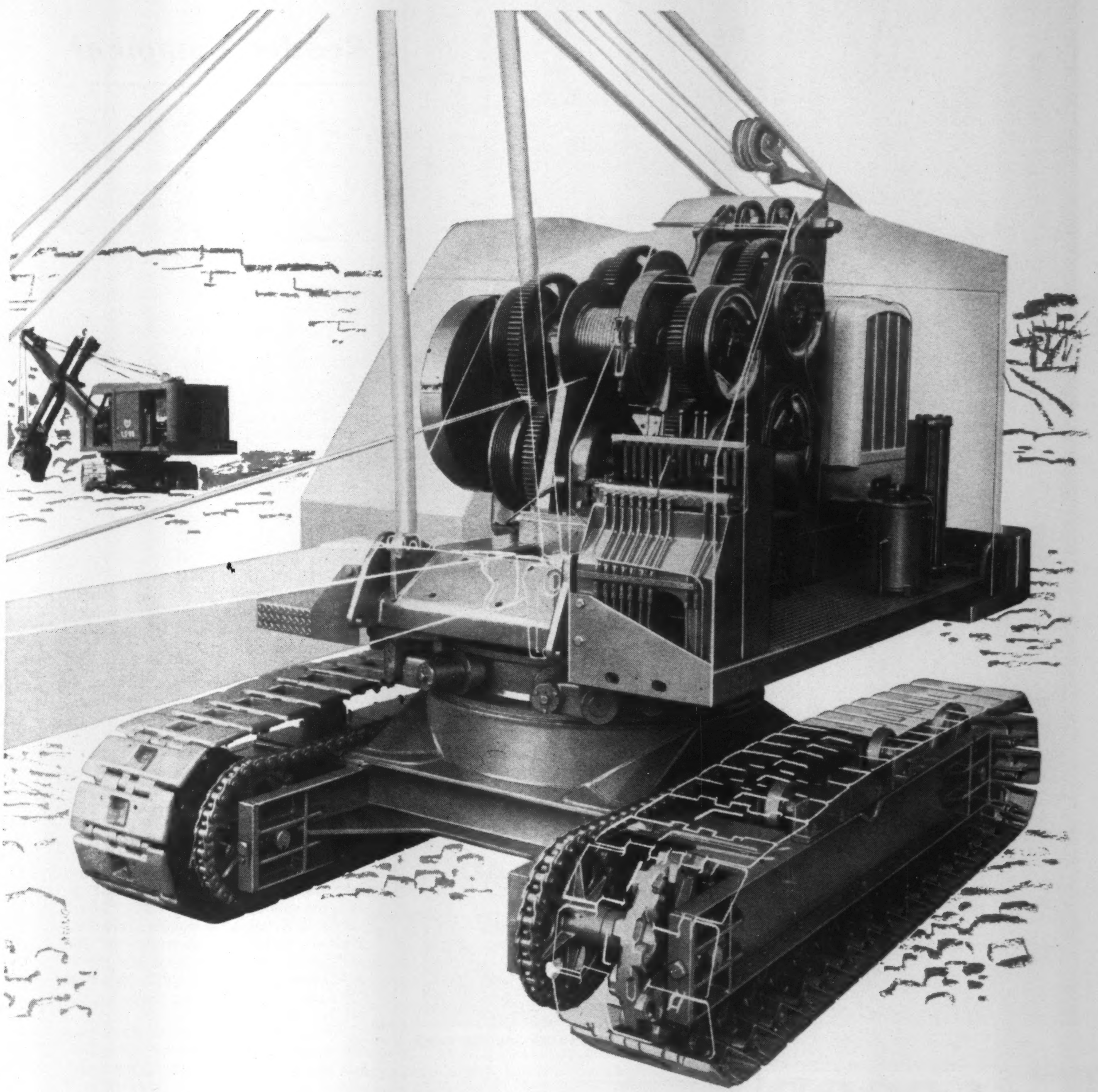
⑥ **Fast, simple removal of any operating shaft!** Brake drums, clutch spiders and bevel gears are involute-splined to the shafts . . . no press fits or keyways used.

⑦ **No heat transfer between clutch drums and brake drums!** Clutch drums are separated from gears and brake drums to minimize clutch and brake wear.

⑧ **Long-life mechanical drum brakes are easier to operate and service!** Unlike brakes on some shovel-cranes, all moving parts are mounted on antifriction bearings to reduce wear.

⑨ **Lower machinery fully protected against dirt and other foreign material!** Hydraulic power steering and automatic brakes are completely enclosed in a clean, flat carbody.

⑩ **Adjustable, conical hook rollers** follow a true circular path . . . no scuffing or peening. Double flange turntable eliminates center pivot up-pull or wear-causing bind or stress.



NOTE: The entire upper machinery of the Full-Function Design models (8- to 40 ton capacity) can be field-stripped, piece by piece, without removing major portions of the cab. For fully-illustrated, descriptive literature on the various models in the Link-Belt Speeder line, see your distributor. Or write: Link-Belt Speeder Corporation, Cedar Rapids, Iowa. 117-61N

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7 truck-cranes
3 self-propelled

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the ORIGINAL self-drilling system
automation in concrete anchoring
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CIRCLE 10 ON READER SERVICE CARD

Reader Comment

Engineers or Architects

SIR—In your article Fewer Big Consultants, A-Es; More Architects (ENR Aug. 17, p. 24) it is shocking to see that, compared to about 2,200 engineer and architect-engineer firms in the $100,000 + class, there were 3,800 architects, with the number growing. At first sight, it looks as if engineering is on the way out as an independent profession.

Actually the bare statistics you show do not tell the whole story. Although 3,800 architects did over $100,000 of business each, that business was to a great part engineering, which engineers practicing in different branches did as project associates of the architects. The modern tall office building is one-fourth structural items in foundation, frame and floors, and slightly less for mechanical and electrical items, each; more than one-half of the cost of construction is by design in the three major engineering branches. Professional traditions, from before present-day functionally engineering building design, class as architects many firms which might, more correctly, be included with A-E firms in your statistics.

If the engineers had been the prime professionals, as should be the case on all industrial and many other buildings, with architects as project associates, the true engineering services would show up more clearly.

BENGT F. FRIBERG
Consulting Engineer
St. Louis, Mo.

Architects in Houston

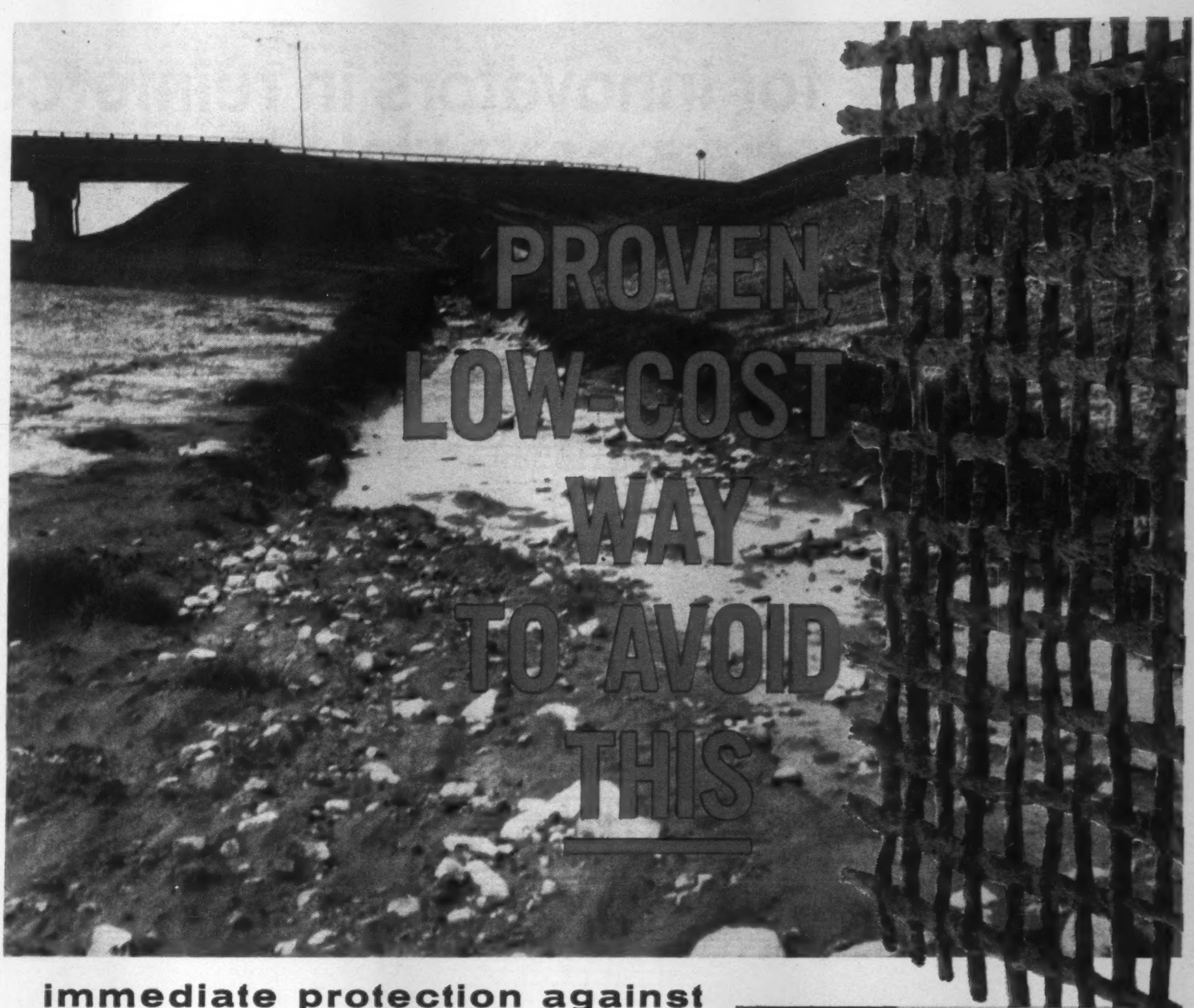
SIR—In the article Houston: Loose Rein for Growth (ENR July 20, p. 28), the reference to the 44-story Humble Oil & Refining Co building mentions Welton Becket & Associates as the architects. Golemon & Rolfe and Pierce & Pierce, two architectural firms in Houston serving as consultants on the project, were omitted.

Also in the section on the jet airport the engineers were given proper credit, but the architects were not mentioned. Again it happens to be an association of the same two firms, Golemon & Rolfe and Pierce & Pierce.

ALBERT S. GOLEMON
Golemon & Rolfe
Houston, Texas

(*Reader Comment continued p. 24*)

Engineering News-Record welcomes expression of opinions from its readers. Comment should be as brief as possible and pertinent to subjects of current construction importance. Letters should be addressed Editor, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.



immediate protection against roadside erosion . . .

SOIL SAVER

Each day, erosion from rain and water run-off cuts into the highway investment of every state. If you share in the responsibilities of highway planning, building and renewal, then erosion, its defeat and prevention, is your concern. You, of all people, should know about Soil Saver.

Soil Saver is a heavy jute mesh. It is simple as dirt, and almost as cheap! It costs, in fact, some 75% less than sod, and 1400% less than asphalt or concrete paving. Wind, water or growing grass cannot displace it. Many leading state highway design engineers across the nation now include it in their original specifications. They have seen how it protects seed and soil in critical areas until grasses take over.

Soil Saver belongs in your plans. Get the facts . . . write for full details to Dept. EN-91.

LUDLOW TEXTILE PRODUCTS
NEEDHAM HEIGHTS 94, MASS.
A Division of Ludlow Corporation

ABOVE: Soil Saver applied to critical center of steep grade median strip. **BELOW:** Stabilizing grass growing through Soil Saver heavy jute mesh.

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SOIL SAVER
Heavy Jute Mesh
SIMPLE AS DIRT AND ALMOST AS CHEAP

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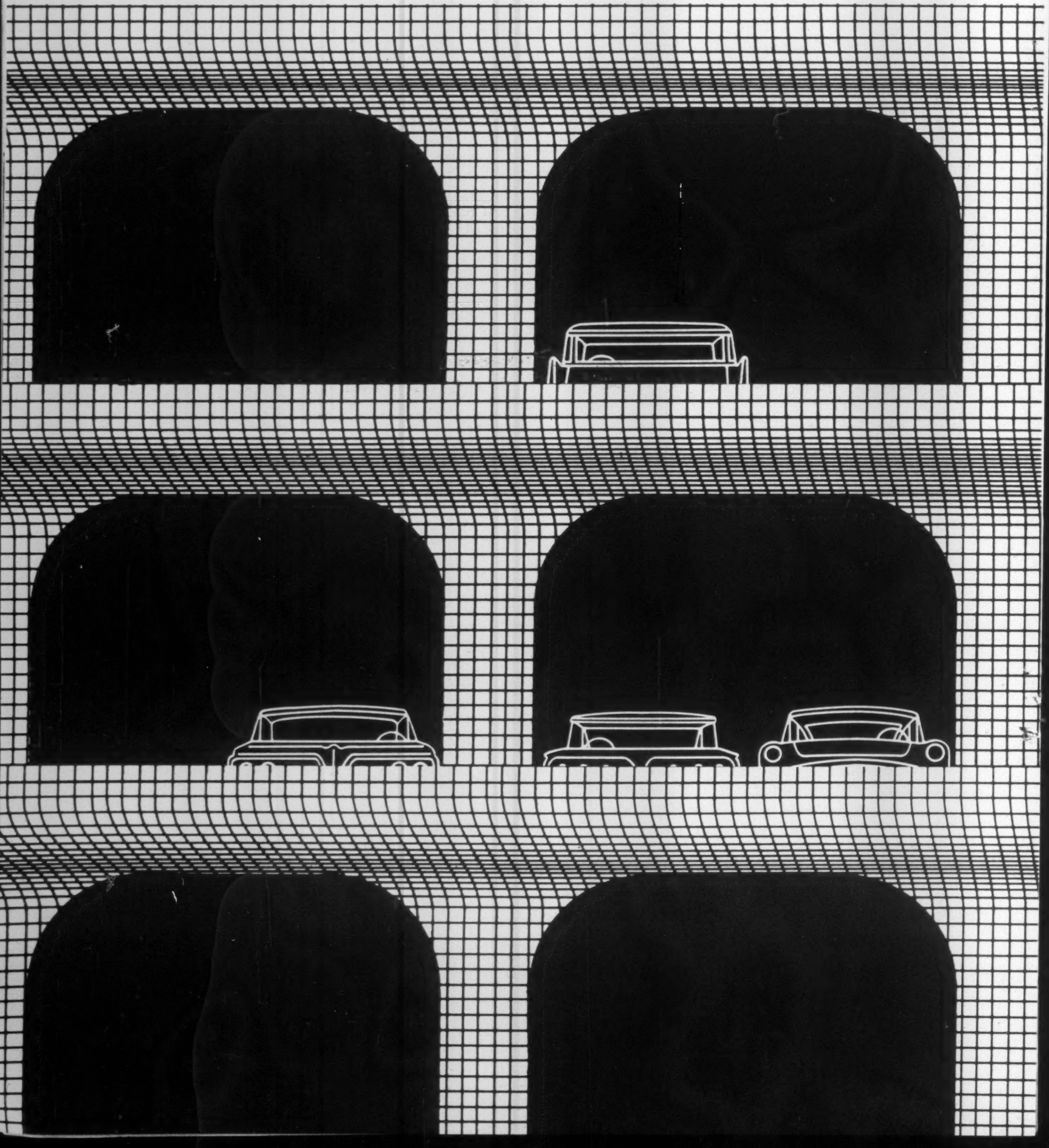
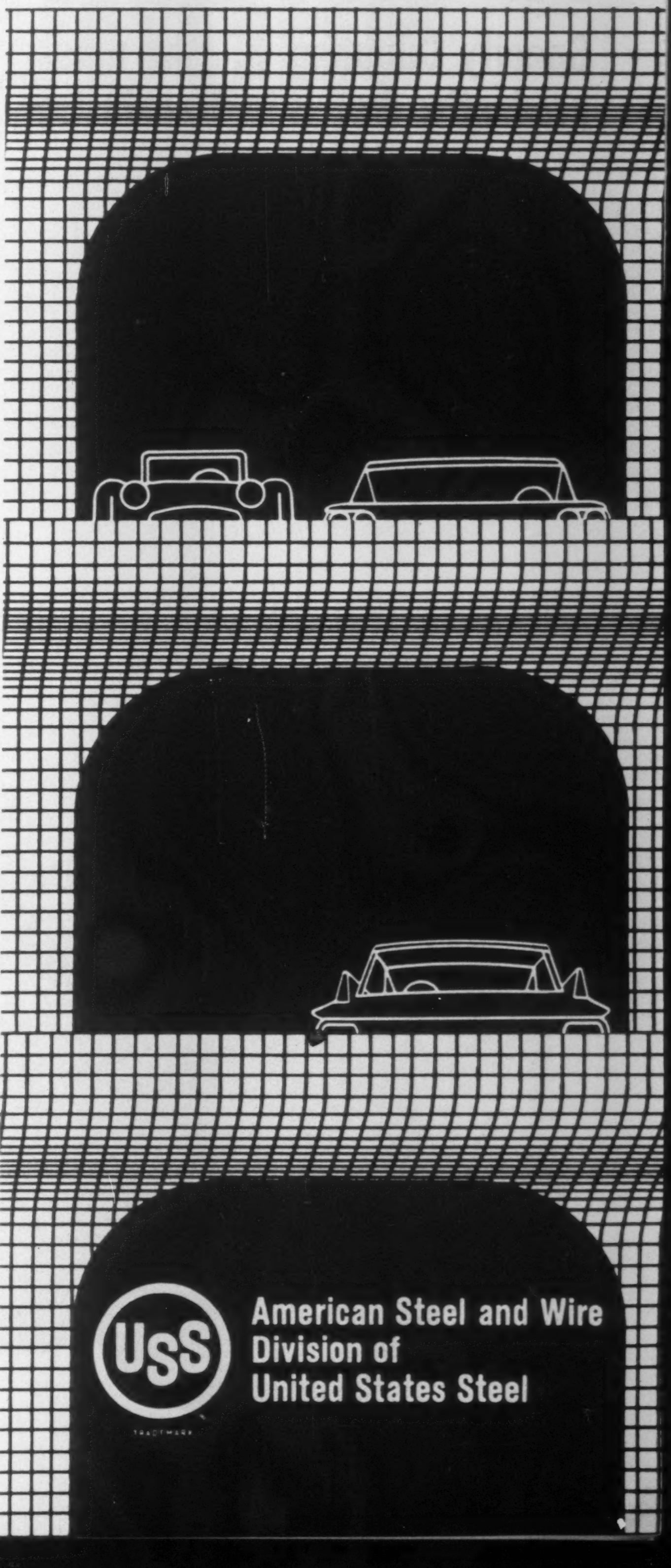


concrete . . .
increases slab strength, lowers costs

Here's a new Structural Wire Fabric that permits high working stresses for all reinforced concrete jobs such as this parking garage. Structural Wire Fabric is prefabricated to your exact specifications from cold-drawn wire up to ½″ diameter and spaced as close as 2″ on centers in both directions. Its minimum tensile strength is 75,000 psi with a minimum yield strength of 60,000 psi. All intersections are electrically welded . . . provides positive mechanical anchorage in the concrete. ■ Structural Wire Fabric is delivered to the job in cut-to-size sheets that can be quickly and more accurately placed . . . inspection is simplified. It eliminates thousands of time-consuming placing and tying operations required by bars . . . goes in at least ⅓ faster and saves on placement costs. ■ If your current or future designs call for a departure from yesterday's limitations, consider Structural Wire Fabric. We'll be glad to assist you or your structural consultant with complete technical recommendations. Just contact our nearest sales office or write American Steel and Wire, Dept. 1254, Rockefeller Building, Cleveland 13, Ohio.

Innovators in wire



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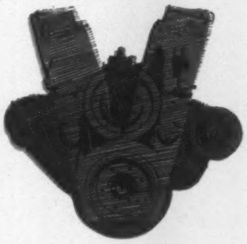
Cummins construction diesels deliver the power that digs in, day in and day out. 44 models are available from 70 to 700 horsepower. They provide faster work cycles, lower operating costs, and require less maintenance than ordinary off-highway power.



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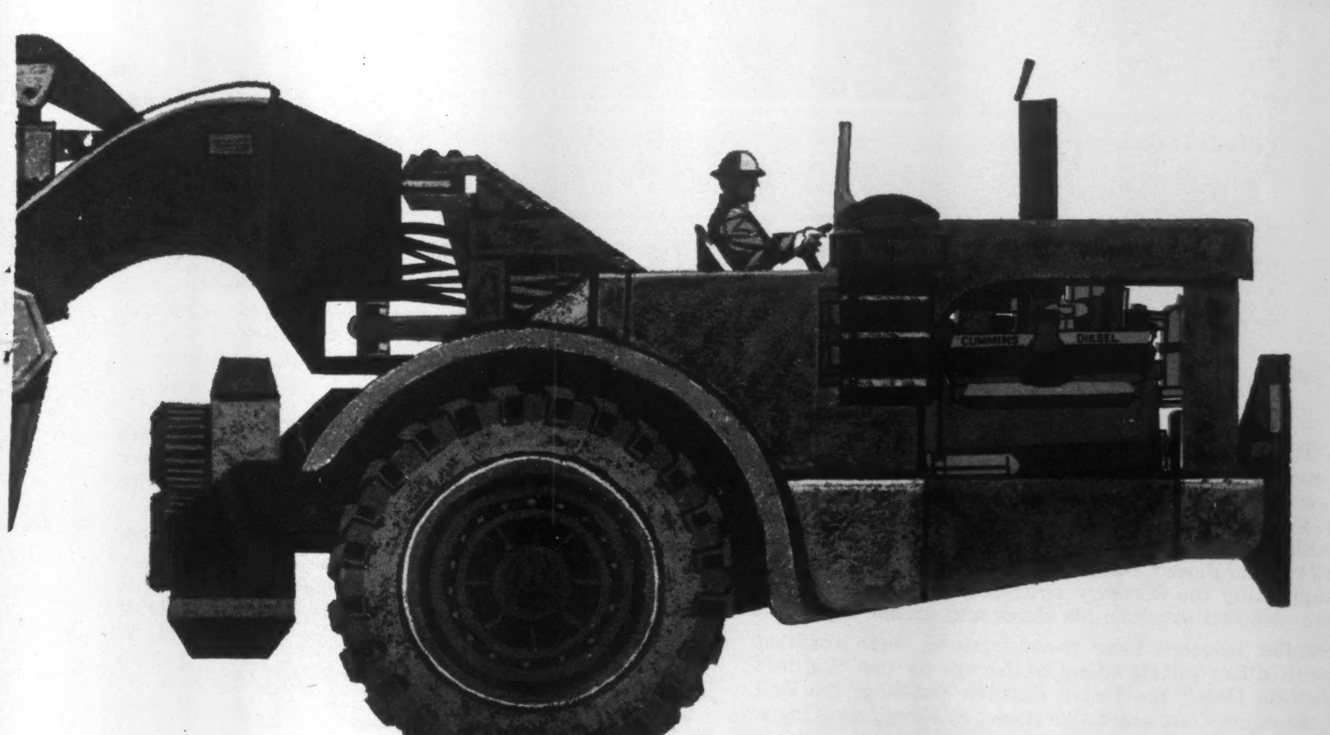
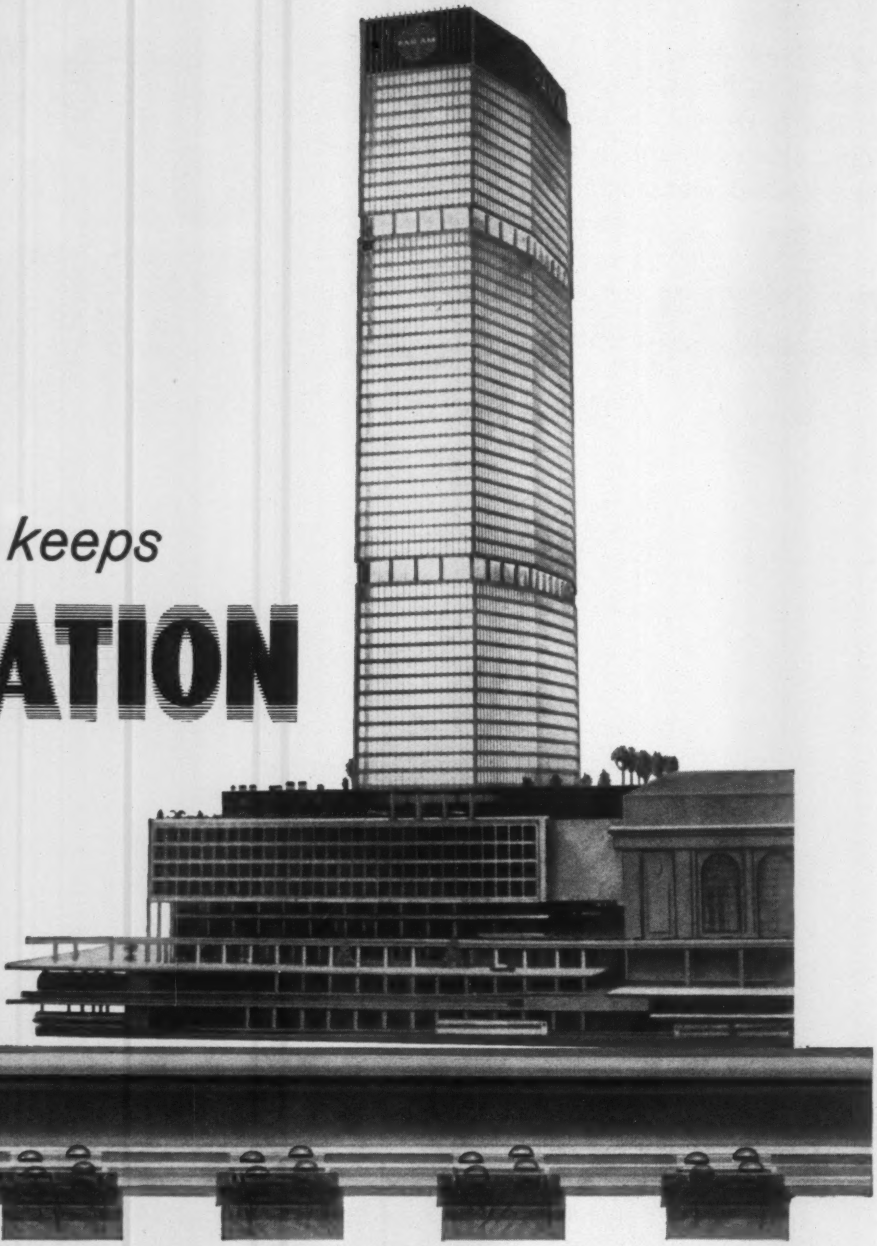


CIRCLE 17 ON READER SERVICE CARD

Lead keeps

VIBRATION

on
the
track



Pads for Pan Am Building supplied by John F. Abernethy & Co., Inc., New York City

for Pan Am Building

—Trains rumble endlessly on New York Central tracks beneath the Pan Am Building, now rising in Manhattan—every effort and engineering technique is being exerted to insure that occupants of the largest commercial office building ever built will be comfortably isolated from vibration. Placed beneath each of 238 steel columns supporting the 59 story structure, lead-asbestos pads are installed to muffle the shock and sound.

Similar cushions have already proved their worth at such other outstanding buildings as the Waldorf Astoria Hotel, the Union Carbide Building, the Bell Telephone Company Laboratories in New York, Queen Elizabeth Hotel and the Canadian National Railway Station in Montreal.

Why lead? Because along with its vibration-damping properties, lead seals out moisture, can carry the heavy loads encountered in foundations. And lead's durability assures the pads will last for the building's life.

These properties of lead can serve *you* well in many problems involving vibration suppression or sound attenuation — in architecture or heavy machine design. Write today for detailed information to Lead Industries Association, 292 Madison Ave., New York 17, N. Y.

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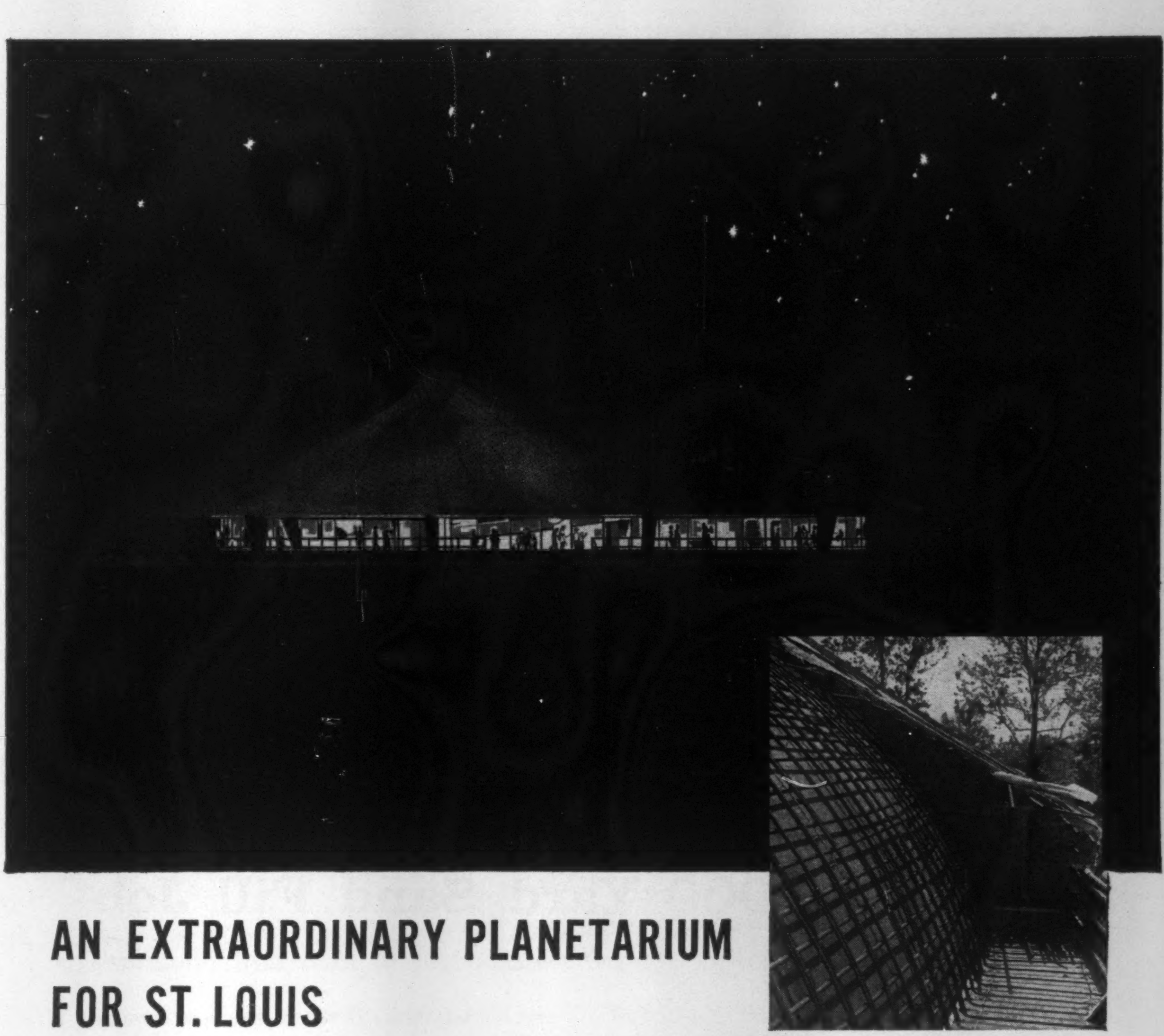

AN EXTRAORDINARY PLANETARIUM FOR ST. LOUIS

Architects Hellmuth, Obata and Kassabaum have made a dramatic departure from the conventional with this unusual structure nearing completion in St. Louis' Forest Park.

Exterior shell is a graceful one-sheet concrete hyperboloid, elevated on evenly-spaced columns around the perimeter, and topped by an observation deck on which telescopes will be mounted for viewing the night sky.

Within is the planetarium itself, a circular auditorium seating 400, enclosed by an aluminum dome on which images of the constellations will be thrown by projection devices. Surrounding the planetarium is a 9000 square foot area for astronomical exhibits. The basement floor includes offices and service rooms, a smaller exhibit area and lecture rooms.

Laclede Steel Company is privileged to have supplied the reinforcing steel for this unique new planetarium, which was built by Gamble Construction Co. Albert Alper was structural engineer, and Ketchum, Konkel & Hastings structural consultants.

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6143

Ulland Bros. Add Second SKOOPER on 450,000-Yard Sand Fill Job

One SKOOPER sells another on job that is test of men and machines

Ulland Bros. put their first Koehring® 205 Skooper to work early in 1960 — used it on a variety of jobs in and around Duluth. Then the company was awarded a contract to move some 450,000 yards of dredged sand on the Duluth-Superior Bridge Project.

The job demanded two machines and Ulland set out to determine the most productive and profitable equipment for the contract. Several rubber-tired front-end-loaders were tested. Crawler models were ruled out due to the abrasiveness of the material. The Skooper served as a basis of comparison.

Water draining from the stockpiled material made loading conditions difficult. The de-watered material had a tendency to set-up, pack tight, become extremely tough to dig and move. For every two loads per front-end-loader, the Skooper dug and loaded three . . . put 15 to 16 tons in a truck on the average of 2 to 2¼ minutes. Even under the most adverse conditions the Skooper averaged between 233 and 250 yards an hour over a nine hour shift.

So . . . Ulland bought another Skooper.

Why? The Skooper's standstill dig, swing, dump cycling netted bigger payloads. Its 7-ft. level crowd coupled with its powerful hydraulic break-out force enabled the Skooper to load more — faster — than any comparable machine on the job. The Skooper proved without a doubt — there's nothing like it on wheels or tracks!

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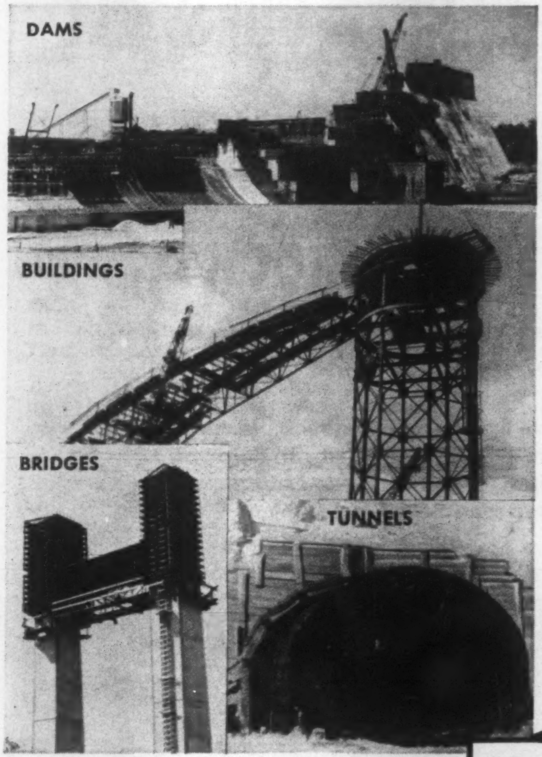

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HARD ROCK?
TOUGH ROCK?
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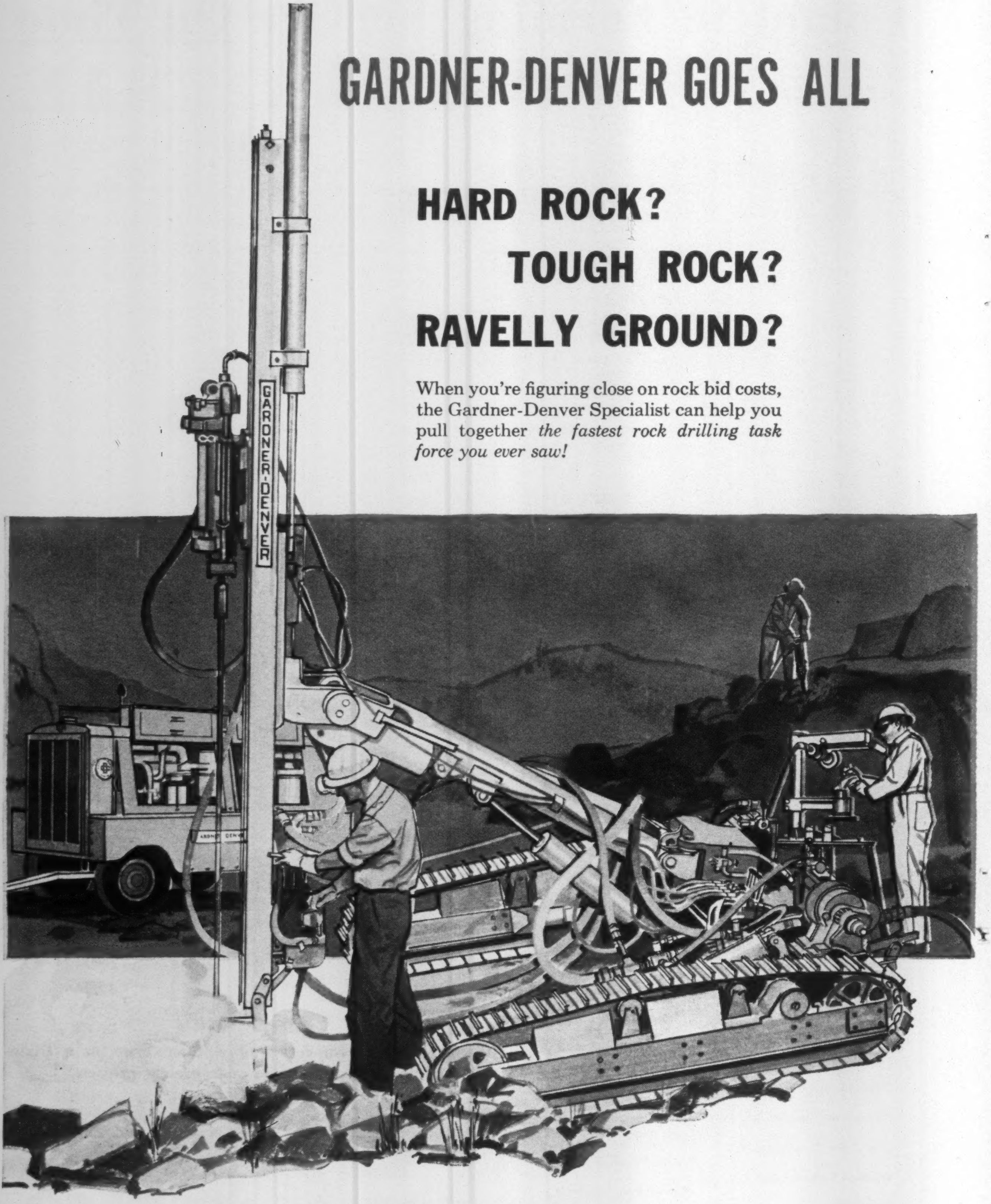
When you're figuring close on rock bid costs, the Gardner-Denver Specialist can help you pull together *the fastest rock drilling task force you ever saw!*



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- Heavy-Duty HT143 Crawler Drill with 5½″ percussion drill for big bore blast hole drilling.
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- And for low-cost air power—the new Gardner-Denver Rota-Screw Portables provide immediate, steady compressed air in any weather or climate. They'll slash your maintenance costs because there are no blades or other moving parts in the compression chamber.

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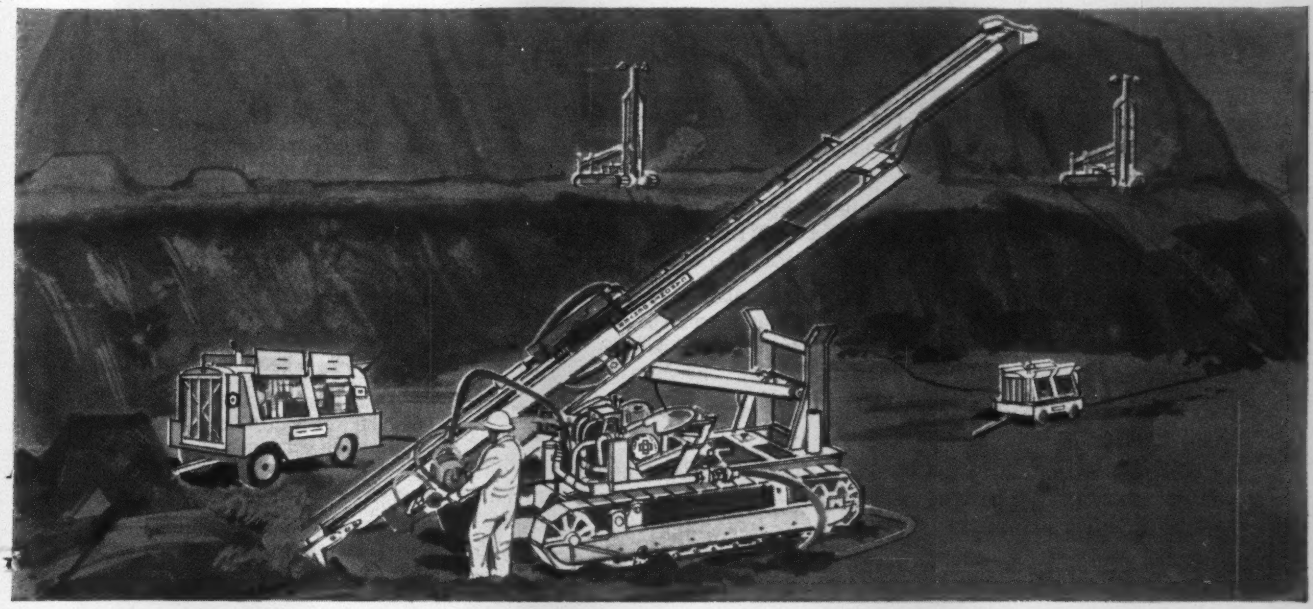

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CIRCLE 23 ON READER SERVICE CARD

who framed this engineer?

He was Sanitary Engineer working on the construction of an Air Force base in Texas*. He's a good engineer—asked for the right kind of sanitary sewer pipe. But the regulations read "lowest bidder," so he got a substitute that he didn't want.

Six years later the substitute pipeline had to be dug up, at tremendous expense to the taxpayer. Everybody forgot by that time that the framed engineer had screamed for the right pipe in the first place.

Before the war, only Lifetime Vitrified Clay Pipe was used in sanitary sewers on Federal projects. During the war, the Clay Pipe people couldn't keep up with the sudden, unprecedented demand, so standards were lowered to allow substitutes.

There's no Clay Pipe shortage now, and there's still no real substitute for Lifetime Vitrified Clay.

But outmoded Federal, State and Municipal regulations haven't been changed. They can mean many more framed engineers.

And taxpayers are forced to spend millions of dollars each year to replace sewer lines that should have been installed with lifetime pipe—Vitrified Clay Pipe with new cost-cutting factory-made compression joints—in the first place.

Name of Air Force base on request.

COMPRESSION SEALED, VITRIFIED
CLAY IMPERVIOUS PIPE
THE STANDARD in SANITARY SEWERS

NATIONAL CLAY PIPE
MANUFACTURERS, INC.
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NATIONAL CLAY PIPE MANUFACTURERS, INC.
1028 Connecticut Ave., Washington, D. C.

Please send me full details on the new factory-made compression joints on Clay Pipe.

(name)

(company)

(street address)

(city and state)

B-7C23 EN

Spotlight on Building

SIR—Your recent story on The Money-Makers (ENR May 18, p. 212) made interesting reading in more ways than one. For one thing, I believe your magazine is the first ever to attempt to compile the profits and losses of the major, publicly-held engineering, construction and building companies. For displaying this courage, congratulations!

Most importantly, I think, the article shows the cyclical nature of our industry—how a company may be quite prosperous one year, not so financially well off the next. Also, the story brings out the various types of construction specialties there are in the over-all building industry. In short, with this financial story, you have pierced the veil of the building industry, or at least a good cross section of it.

Again, congratulations for an interesting story well done. I trust you will make it an annual feature.

CLIFFORD S. STRIKE
President
F. H. McGraw & Co.
Hartford, Conn.

Peru Project Questioned

SIR—The statement in the recent brief news item (ENR July 27, p. 24) that: "The Big Mantaro hydro project in Peru moves a step closer to realization," is a rather surprising pronouncement, and much important information should be available before venturing it. Since I examined the Mantaro Bend site several years ago in considerable detail, it may be helpful to point out one of the various details which compelled me to draw the conclusion that this propect site did not lend itself to sound economic development.

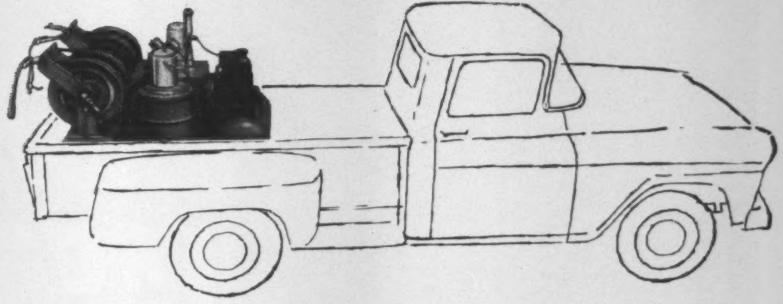
At the outset I was impressed by the apparent potentialities of the site because the topographical features are very favorable for a high head project. These features, in combination with the reported available river discharge, indicated possibilities for developing at least a million horsepower.

A detailed investigation was undertaken in good faith and included a geological reconnaissance and aerial mapping of the terrain. A new gaging station was also established to obtain a more reliable record of river discharges.

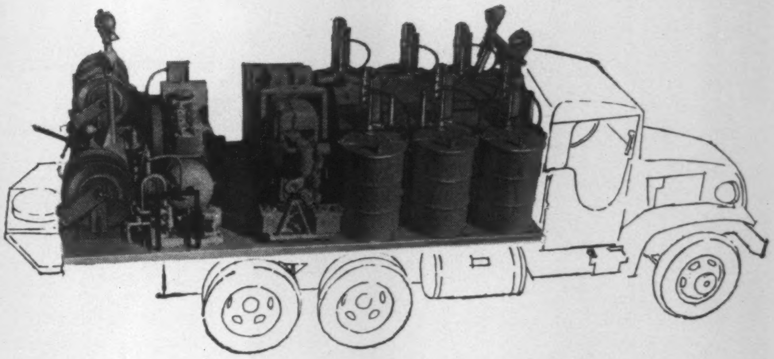
The subsequent correlation of new gaging records with those reported from the "official" gage disclosed a surprisingly large discrepancy. This led to an examination of the gaging procedures at the "official station" and it was found that daily discharge observations were being made by lowering a current meter at some eight or ten positions in the width of the river, but in a reach would normally be classified as a cataract. (The reason for making the observations at this point was that a small bridge spanned the river and a

(*Reader Comment continued p. 35*)

FROM THE SIMPLEST



TO THE MOST COMPLETE



Lincoln Lubrovans® and Lubmobiles® are Custom-Assembled to YOUR Job Requirements

These lube and service stations on wheels are tailored to the needs of your construction job. They're easily assembled into any combination from standard Lincoln components: pumps, compressor, reels, hose, fittings, etc. They bring the basic maintenance services—trac-roll and chassis lube, motor oil, gear lube, air and water, gasoline and diesel fuel—right to the jobsite. They can be as big or little, as simple or complex as you desire.

If you wish, you can even assemble your own rig. The Lincoln representative will be glad to help you select the components you need.

Meantime, if you'd like to see some typical rig assemblies, send coupon for Lincoln's latest catalog and manual.

LINCOLN ENGINEERING COMPANY
4010 Goodfellow Blvd., St. Louis 20, Mo., Dept. ENR-9

Please send me Lincoln equipment catalog and manual illustrating typical Lubrovan and Lubmobile installations.

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Modern Chemistry teams up with Engineering to give you

NERVASTRAL WATERSTOP & WELDBAR*

*PATENT PENDING

The most Impervious, Foolproof, Easy-to-apply Waterstop System ever developed

Just as a chain is no stronger than its weakest link, no waterstop can be better than at the points where it has been spliced. Original planning and research has now made it sure and easy to have durable water-tightness at the spliced waterstop joints.

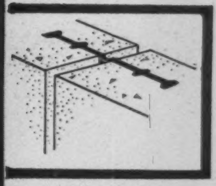
Nervastral Weldbar eliminates the necessity of meticulous matching of non-uniform cross sections of waterstop. It also makes possible the formation of T joints, L joints or butt splicing. There is no need for clamping, forming or chemical curing. Nervastral Weldbar (as shown below) can be easily softened by heat to allow the ends of Nervastral Waterstop to be pressed into it. The Weldbar sets by cooling within a few seconds, and becomes an integral part of the Nervastral Waterstop.

Nervastral Waterstop and Nervastral Weldbar are formulated from a compound based on polyvinyl chloride. This material is completely resistant to Portland cement solids, acids, alkalies, water, mildew, fungi and oxidation. It does not bleed at high temperatures and never cracks when the temperature is low.

The longitudinal ribs on Nervastral Waterstops are engineered to assure complete integration with concrete so that they are always firmly anchored and expand and contract with the concrete, never allowing a drop of water to come through or around them.

The most important physical characteristics of Nervastral Waterstop and Nervastral Weldbar are great tensile strength, excellent shear resistance and a high degree of resilience and recovery.

Write for technical details and write fully about any difficult problems for which you want a solution by Rubber & Plastics engineering department.



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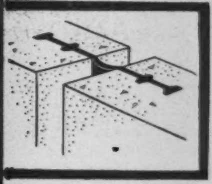

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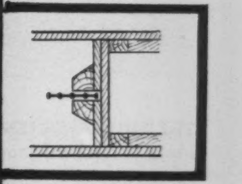

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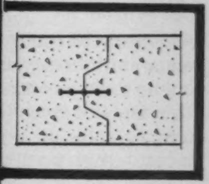
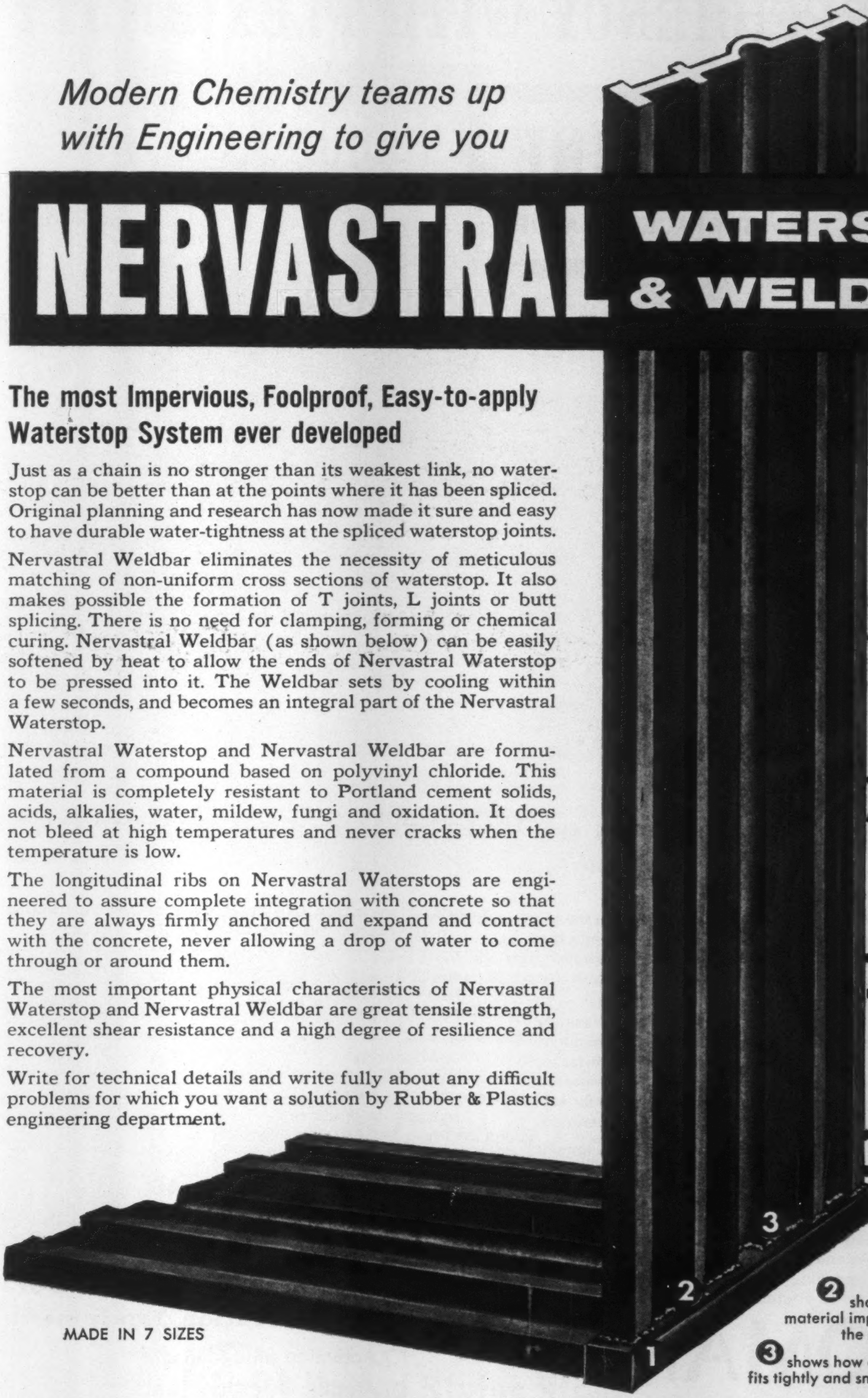


INSTALLED



MADE IN 7 SIZES

① is the Weldbar

② shows the head of fluxed material impinged up and around the sides of the Waterstop

③ shows how every contour or curve fits tightly and snugly into the Weldbar

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CIRCLE 27 ON READER SERVICE CARD

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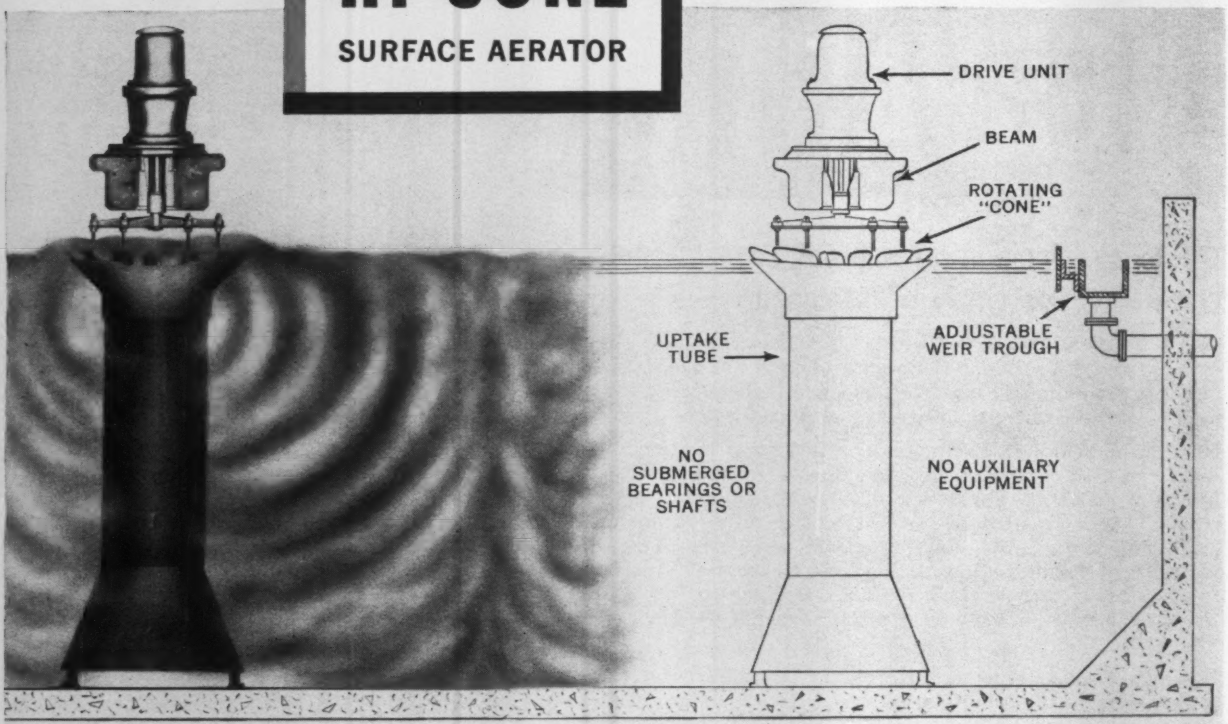

Units for ALL Sizes of Waste Treatment Plants

THE TRUE EFFICIENCY of any type of sewage aerating equipment is best measured in terms of oxygen dissolved into the sewage, not air "delivered" to it. Until the oxygen is in solution, it is not available to the aerobic organisms responsible for purification.

As a result of recent investigations, it is becoming increasingly apparent that oxygen absorption is almost entirely dependent on the rapid and continuous creation of liquid-to-air interfaces. This fact has been long known but not forcibly demonstrated until recently. All oxygen absorption occurs at the liquid "surfaces"—regardless of equipment design or method of aeration.

Therefore, the gauge of efficiency, whatever type of equipment you consider, is "lbs. of oxygen absorbed per KWH."

Compare Hi-Cone's "efficiency rating" with any other aeration equipment. At the same time, investigate the ease with which Hi-Cone handles variations in waste flows and strength through easily adjustable weirs and variable operating speeds. You can get this information by asking your Yeomans representative or the factory for the studies offered at right.

TYPICAL FLEXIBILITY AND EFFICIENCY OF NO. 70 HI-CONE (OXYGENATION CAPACITY—20° TAP WATER)

Inches of Cone Exposure	R.P.M.	Lbs. O_2 Absorbed per Hour at 20° C	NET KW	NET KWH per Lb. Oxygen Absorbed
½	34	37.2	7.0	.188
½	42	57.5	9.9	.172
2	38	38.7	7.3	.189
2	46	54.0	10.0	.185
4	34	27.7	4.9	.177
4	50	54.0	9.5	.176

Now Available! Basic Data For Evaluating Aeration Equipment

☐ Activated Sludge Plants
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H-6139

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WASTE HANDLING SPECIALISTS FOR OVER 60 YEARS

48-ton "hot rods" won't damage this road!
It's made with USS Blast Furnace Slag

Here's an all-slag road that gets tough punishment all year, yet it's still as good as new. The road is used for hauling red-hot steel slabs from one mill to another at the Gary Works of United States Steel. When loaded, each of the four-wheeled straddle buggies used weighs 48 tons, and they run a total of 100,000 trips per year. The steel slabs carried are so hot (1800°F) the buggies can't stop, because the tires will burn, but the road shows no sign of wear. Even quick thawing and refreezing during the winters has caused no damage.

When the road was constructed, eight inches of reinforced slag concrete pavement (portland slag cement, sand and crushed slag aggregate) were laid over a base course of three inches of crusher-run slag and four inches of compacted granulated slag subbase.

USS Blast Furnace Slag is the all-purpose road-building aggregate. In addition to being hard, tough and stable, it is angular in shape and has many rough "pocketed" surfaces which provide a tight bond with bitumen in black-top mixtures, and with cement mortar in concrete. Slag aggregate improves pavement skid-resistance; and compared with other aggregates weighing up to 50% more per cubic yard, slag yields more paved surface per ton.

Granulated slag, moreover, provides added support and drainage when used as subbase under flexible or rigid pavement; and mixed sizes of air-cooled slag are extensively used for stabilizing roadway shoulders. Specify USS Blast Furnace Slag on your next road project. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS United States Steel

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Save Hours . . .

Use **SONOCO** *fibre Construction Products*

Sonoco Fibre Construction Products speed construction, save labor, conserve materials, and permit new design and structural features. They have proved valuable to contractors, architects, engineers, and owners everywhere as evidenced by their widespread use.

Backed by over 60 years of Sonoco experience, these products are engineered to exacting industry requirements and subjected to rigid quality control through every step of manufacture. You are assured of uniformly high quality with every order.

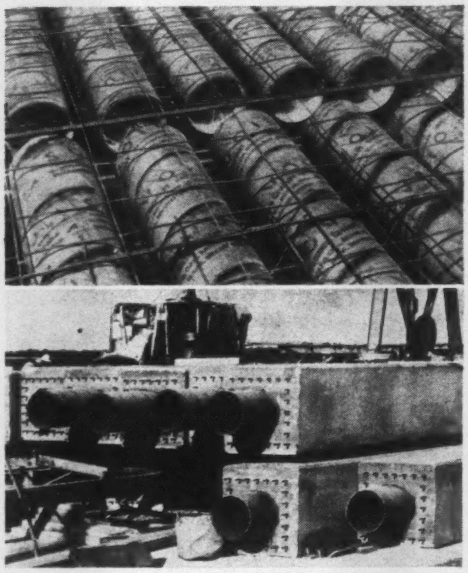
VOIDS in Concrete Slabs and Piles Save Materials and Money

Form voids in concrete construction with

SONOCO

SONOVOID®

FIBRE TUBES



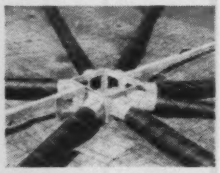
In concrete slabs, decks, and precast piles, voids formed with SONOVOID Fibre Tubes displace low-working concrete . . . thus reducing weight as well as the amount of concrete and reinforcing steel required. This load reduction means additional savings on foundations and supporting members, permits the design of longer span slabs, and makes precast piles easier to handle and drive.

Sonoco SONOVOID Fibre Tubes are *designed* to form voids in concrete construction. They are low in cost, lightweight and easily handled, and save both contractors and owners time, labor, materials, and money.

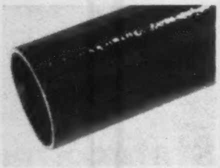
Order SONOVOID Fibre Tubes in sizes from 2.25″ to 36.9″ O. D.—standard 18′ lengths or as required. Can be sawed—end closures available.

Other **SONOCO** Fibre Construction Products

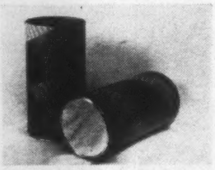
DUROPIPE Bituminized Fibre Pipe—regular or perforated



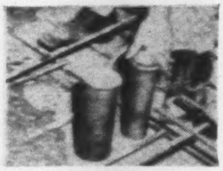
SONOAIRDUCT Fibre Duct for slab perimeter heating



P.I. PIPE—pitch-impregnated pipe in sizes to 36″ I.D.



SONOMOLD Fibre Molds for concrete test cylinders



SONOPIPE SLEEVES

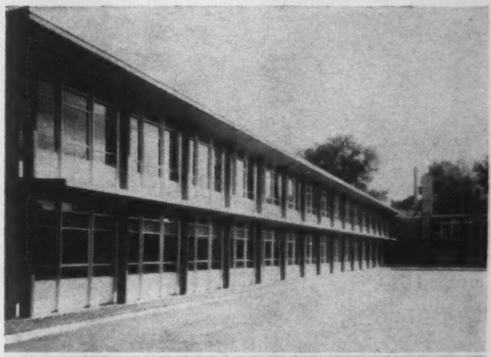
Save Dollars!

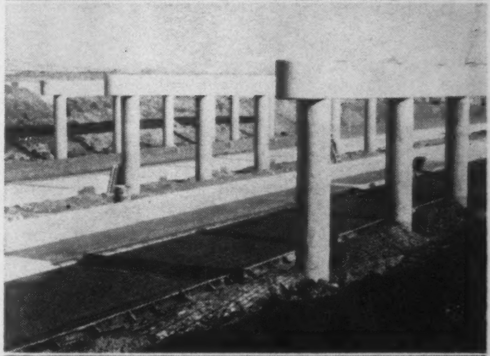
Reduce Costs of Round Concrete Columns and Piers . . . with

SONOCO

Sonotube®

FIBRE FORMS





In bridges, overpasses, buildings, or any structure, SONOTUBE Fibre Forms speed construction and reduce costs . . . by forming round concrete piers and columns faster and more economically than any other method.

With their light weight, SONOTUBE Fibre Forms handle easier and are quickly placed, braced, poured and stripped . . . thus saving contractors time, labor, and money. Versatile too, these forms can be sawed for tie-in with other forms and punched for anchor bolts and dowel rods or cut for utility outlets.

Use Sonoco SONOTUBE Fibre Forms wherever round concrete columns are specified—choose the type that meets your job requirements most economically:

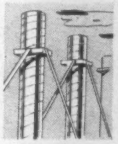
1. **"A" Coated** (patented)—standard form for exposed columns; permits painting or plastering of stripped column.
2. **Seamless** (pat. pend.)—premium form for finished columns; produces a smooth, continuous concrete surface.
3. **"W" Coated**—wax coated form for columns where stripping is not necessary or finishing not required.
4. **Encasement Form**—to encase existing columns, piling, posts, and utility lines with concrete.
5. **Special**—forms for use in water or excessively damp places are available on special order.

Order SONOTUBE Fibre Forms in sizes from 2″ to 48″ I. D., in specified lengths or standard 18′ lengths. Can be sawed at the job.

Lightweight and easy to handle

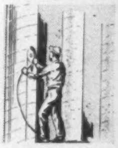
Can be sawed to size on the job

Place by conventional means



Only minimum bracing is required

Pour by normal method at normal rate



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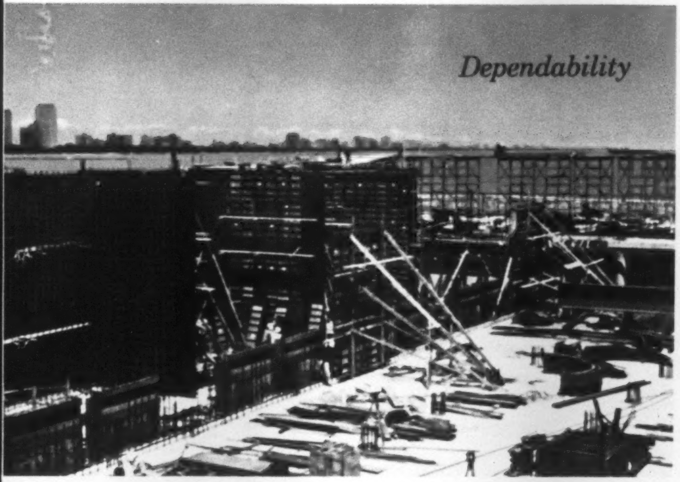
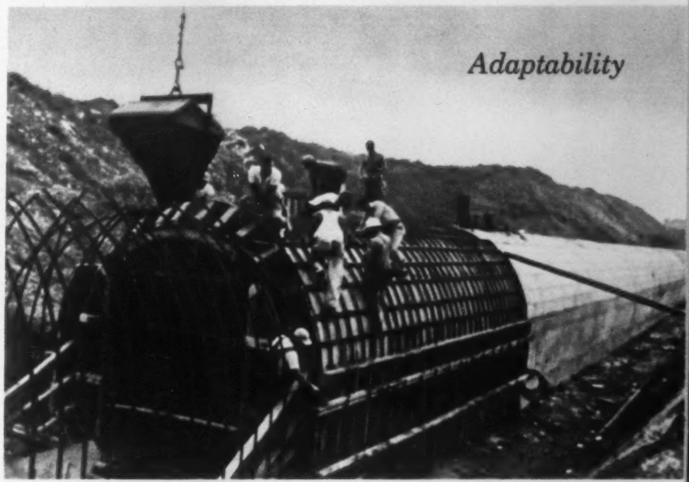


Pour 100 Yds Concrete Per Hour

The job: Chicago's big new filtration plant. The need: forms which would take the abuse of fast, frequent pouring; also forms easily moved. Solution: Symons Steel-Ply, a form which past performance showed would stand lots of abuse, give many reuses and which could be used for all types of wall construction; straight, curved, battered or cut-up. Typical pour: 100 yds of concrete per hr.

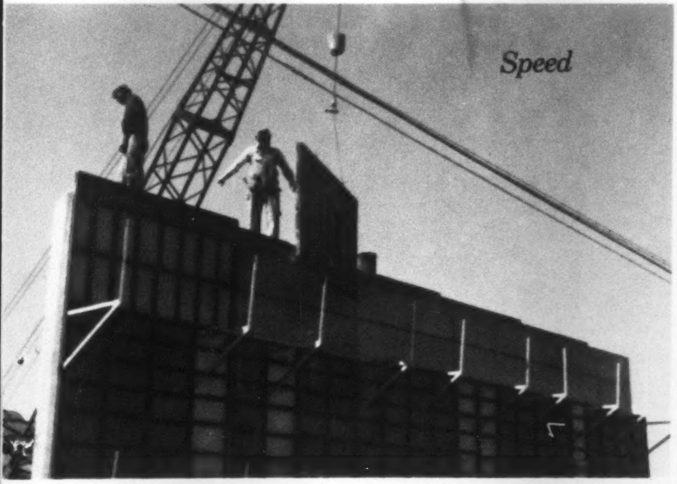
Contractors: S. N. Nielson Construction Co., and Paschen Contractors, Inc., both of Chicago, Illinois.



Jumbo Forms Simplify Sewer Job

Just 3½ months: this was the contract deadline on this big job—building a sewer of pipe 13 ft in diameter and 15″ thick. Inside forming here consisted of three sets of Symons jumbo forms similar to a gang form section. Jumbo forms had hinged ribs and rode on plank rails. Each section was 32′ long and consisted of 12″ fillers. Outside forming was made up of 14″ and 16″ fillers.

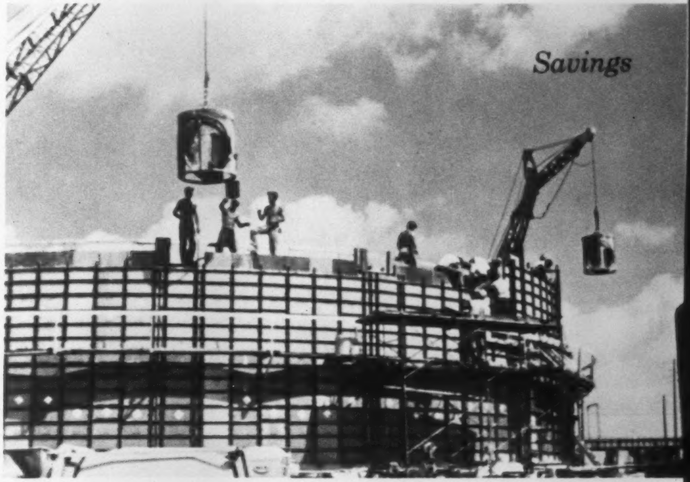
Contractor: National Engineering and Contracting Company, Cleveland, Ohio.



Ganging Saves Weeks of Work

With only eight months to build the piers and substructure for nine twin highway bridges, this contractor relied 100% on Symons Steel-Ply Forms. Assembly, stripping, movement and set-up—all were handled by crane. Concrete was poured at the rate of about 3 lineal feet an hour with each pier and sub-structure poured in a continuous operation.

Contractor: Moore Brothers Construction Co., Verona, Virginia



Special Brackets Cut Costs

How to form a series of 80 ft diameter tanks was the big problem on this job. Symons Steel-Ply Forms solved it by permitting pouring in two lifts—the first, 10′6″ high, 22″ thick—the second, 14′6″ high, 14″ thick. In addition to supplying the forms, Symons furnished three sizes of special haunch brackets. 22 brackets were reused four times at a cost far below that of job-built brackets.

Contractor: Calumet Construction Company, Hammond, Indiana.

For the complete story on each of these jobs, write us. Ask also about our free engineering service . . . rental-purchase options . . . and complete-line catalog.

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Symons **CLAMP & MFG. CO.**

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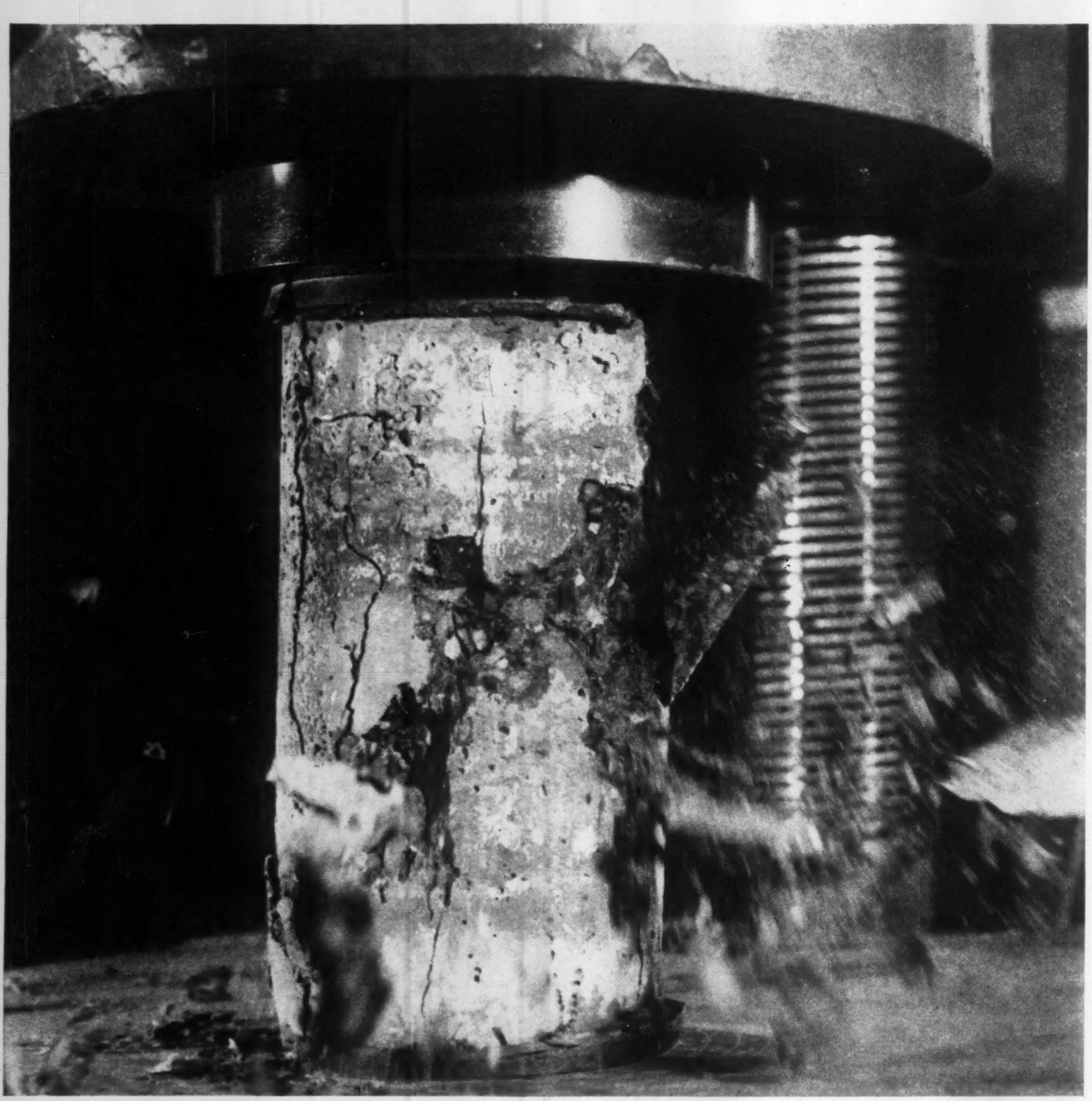

INSURE DESIGN STRENGTH

of concrete cured below 70°F by adding Columbia Calcium Chloride to your mix—2 pounds for every bag of Portland cement. The cylinder shown here was cured under ideal conditions—100% humidity, 70°F, 28 days—to establish the "design strength" of the mix. When temperatures fall, the best way to achieve this design strength in the field is to call on the accelerating power of Columbia Calcium Chloride. Write or call Pittsburgh Plate Glass Company, Chemical Division, One Gateway Center, Pittsburgh 22, Pa. Offices in principal cities. In Canada: Standard Chemical Limited.

PPG chemicals

COLUMBIA CALCIUM CHLORIDE

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few people lived near this crossing. It must be remembered that this site is located in a remote region of the upper Andes.)

It was necessary to conclude that the "official" gaging records were unsuitable for studying the power potentialities. Furthermore, the new records obtained privately demonstrated that only a fraction of the claimed potential of the site was available. The conclusions in the final report were, of necessity, unfavorable.

I am offering this information in the hope that it will help to prevent the misleading of others. This appears to be particularly relevant these days when the prospects of obtaining foreign aid funds tends to generate enthusiasms for projects which on closer examination deserve no serious consideration.

Furthermore, anyone who has acquired some understanding of the economy of Peru and of the very fine people living in it will agree that, if a major project is considered in that country, the available funds should be employed after carefully determining what would best serve that country's interests.

ADOLPH J. ACKERMAN
Consulting Engineer
Madison, Wis.

Me, Too

SIR—I am sure your fine write-up on the American Society for Testing and Materials and its new president, Miles Nelson Clair, will prompt a series of such letters as mine because of the following statement reportedly by Mr. Clair:

"We know of no other consulting engineers in the United States who have a testing laboratory, do research, and design and supervise construction" (ENR July 6, p. 51).

Metallurgical Engineers, Inc., in its small way, is doing exactly this. Although we certainly do not claim the stature that accrues to Miles Clair, nor to his firm The Thompson & Lichtner Co., we are essentially in this same activity in the metal products and process line and have been for ten years.

DAVID B. CHARLTON
Metallurgical Engineers, Inc.
Portland, Ore.

For Your Calendar . . .

Industrial Building Exposition & Congress, New York Coliseum, Sept. 25-28. Write: Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

Engineers' Council for Professional Development, annual meeting, Sheraton Hotel, Louisville, Ky., Oct. 2-3. Write: ECPD, 29 W. 39th St., New York 18, N. Y.

American Society of Civil Engineers, annual convention, Statler Hotel, New York, N. Y. Oct. 16-20. Write: ASCE, 345 W. 47th St., New York, N. Y.

Building Research Institute, fall conference, Mayflower Hotel, Washington, D. C. Nov. 28-30. Write: National Academy of Sciences—National Research Council, 2101 Constitution Ave., Washington 25, D. C.

New H-30 **PAYLOADER**®

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has 25% more capacity

When the Model H-30 was originally introduced, more than a year and a half ago, it was far ahead of any other tractor-shovel in its class. It has been exceptionally well received by contractors, public bodies, sand and gravel producers, and many others — praised by owner and operator alike. Now, HOUGH'S continuing program of research, development and improvement, creates the new H-30 series "B" model — an even better machine.

More Capacity: With 1¼ cu. yd. bucket, this new model has 25% more capacity without sacrificing the exceptional stability and balance of the original H-30.

More Safety: The only loader in its class with boom arms positioned ahead of and away from the operator. It has walk-in operator compartment, new hand rails, new adjustable bucket seat and unmatched operator visibility.

Less Maintenance: The only loader in its class with simplified boom mechanism having 6 to 12 fewer pivot and grease points to service. All bucket and lower-boom pivot points sealed against dust and dirt.

More Power: More hp per pound than comparable loaders. Torque-converter proportions power properly between drive-train and hydraulic needs.

Better Braking: Only loader in its class with 4-wheel, sealed hydraulic brakes, and with "Operator's choice" dual brake pedals that permit operator to brake with or without transmission engaged. Exclusive HOUGH axle design allows servicing of brakes without removing and exposing the planetary hubs to dust and dirt.

It's the only loader in its class with full power-shift transmission that does not have to stop for "range" shifts . . . with separate fan-cooled oil-to-air radiator to cool torque-converter transmission oil . . . with closed, pressure-controlled hydraulic system to keep out air-borne dust and moisture.

For additional information, see your HOUGH Distributor or return the coupon.

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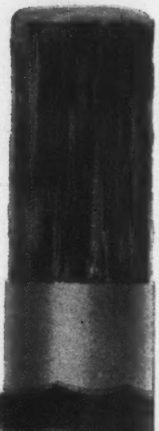
REPEL MARINE BORERS

— PROLONG PILING LIFE



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- **Resistant To Impact And Abrasion From Boats, Flotsam etc.**

CUNILOK®—Waterbury Rolling Mills' specially processed cupro-nickel sheath is a new, low-cost defense against Limnoria (and Teredo) attack.

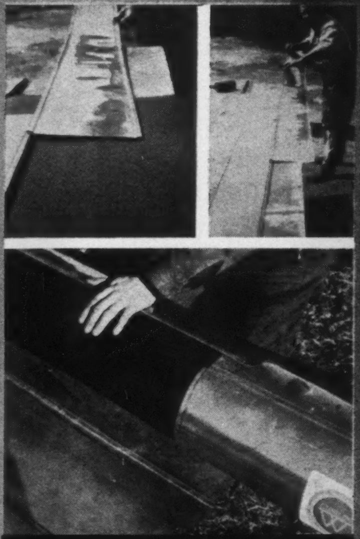
As a shield around creosoted wooden pilings, CUNILOK not only provides a physical barrier to the Limnoria but prolongs the protective function of the creosote by reducing the leaching action of the tidal water. In addition, the thin layer of water between the CUNILOK sheath and the pole becomes a relatively stagnant, low-oxygen area which contains poisonous copper ions and will not support borer life.

CAROLINA POWER & LIGHT APPLIES CUNILOK

Carolina Power & Light Co. is experimenting with the use of CUNILOK to prevent marine borer attack on utility poles in tidal waters along the North Carolina coast.

CUNILOK Is Easy To Apply

The circumference of most marine piling and utility poles varies from 40" to 50". To meet this required width at lowest cost, sheets of CUNILOK are joined longitudinally by a special continuous lock seam. The joined sheets are wrapped snugly around the pole; the ends are overlapped and fastened to the pole with 2" Monel Anchorfast ® slating nails.



CUNILOK sheets are joined by a sliding interlock seam that is manually hammered flat. After wrapping sheets around pole, edges are overlapped and nailed together to pole.

For further information write for this free bulletin or contact your nearest Waterbury Rolling Mills office today.

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West Coast Rep.—J. H. Baxter & Co., San Francisco

CUNILOK—sheathed pole almost ready to be jetted into position at Carolina Power & Light's terminal structure on Bogue Sound Crossing, N. C. In foreground, one CUNILOK-sheathed pole already in place supports an original pole weakened by Limnoria damage.

ENGINEERING NEWS-RECORD

Vol. 167, No. 12 September 21, 1961

Number of copies printed in this issue 88,176

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THE CONSTRUCTION WEEK

TOUCH AND GO—An uprising of Kurd tribesmen in the vicinity of Derbendi Khan Dam has shut down work on this 440-ft-high rockfill in Iraq just as its highly critical closure operations were scheduled to begin. A 20-ft-dia diversion tunnel and an opening in the dam now carry the river flow. Another 30-ft diversion tunnel needs to be quickly finished as the first in a series of steps aimed at closure by November 3. If closure is delayed until a winter flood strikes, a disaster could occur. And this could be blamed on the U. S. contractor, J. A. Jones Construction Co., and the U. S. designer, Harza Engineering Co., though Iraqui government personnel are in complete charge.

IMPACTED AREAS ONLY—Congress passed and sent to the White House this week a bill to extend for two years the impacted-areas school-aid program: About $312 million a year in aid to school districts overcrowded because of the influx of servicemen, federal employees and defense workers.

CHANGE OF DIRECTION?—The Administration is considering boosting maximum allowable interest rates on FHA-insured home mortgages to 5½% from the present 5¼% rate. Since President Kennedy cut the rate from 5¾% to 5½% in February, then from 5½% to 5¼% in May, FHA housing activity has shown a decline.

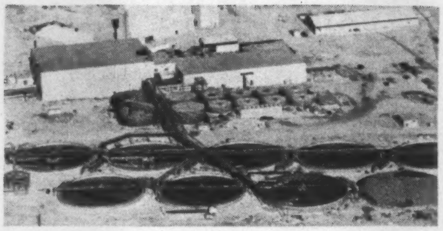
GLUED HOUSES—U. S. Steel's Homes Division will fasten gypsum wallboard to steel studs with adhesive for partitions in its 1962 line of factory-manufactured houses. Nails will be used only at top and bottom of each 4 x 8-ft panel. Savings in a 24 x 36-ft house: 52 rows of 15 nails each.

PHS CALLS POLLUTION PARLEY—The Public Health Service last week held a conference of state and federal pollution control officials because of continuing pollution of an 80-mile reach of the North Platte River in Nebraska and Wyoming. This is the first step in enforcement proceedings.

NO GRATITUDE FOR ASWAN—A Soviet journalist told IZVESTIA readers that Egyptians show little appreciation of Soviet aid on Aswan High Dam. He said an Arab guide escorting him and other newsmen around the site failed even to mention the Russian help.

BUILDING CODES AND SURVIVAL—Look for nation-wide building-code changes to permit construction of family bomb shelters. Residential codes setting minimum requirements for windows, exits and ventilation run counter to every principle that makes for protection—no windows, one entry, and mechanical, non-electrical ventilation.

Before you buy any storage tank...



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WASHINGTON OBSERVER

- **Resumed A-tests will lead to Alaska blast**
- **AEC funds: Hanford's out, Stanford's in**
- **Blatnik: Massachusetts hearings this winter**

- **Resumption of nuclear testing by the U. S. will include experiments with atomic explosions for excavation.** First of these tests will be Project Wagon, an underground blast in Nevada using the equivalent of only a few thousand tons of TNT. AEC engineers expect to be able to extrapolate the results to larger devices.

  The planned harbor test in Alaska will come in a year or so—if testing continues. This is Project Chariot, designed to blast out a channel and turning basin in a remote section of the coast near Cape Thompson. Four nuclear devices, each equal to 20,000 tons of TNT, would be detonated at 400-ft depths to form an entrance channel. Then a device 10 times more powerful would be exploded at 800 ft to form an inner harbor or turning basin.

  What engineers hope to learn chiefly from the forthcoming tests is whether there will be any dangerous radiation after-effects. To determine this, testing must be done with nuclear devices of various sizes at different depths and under all possible kinds of earth and water conditions. If nuclear devices can be exploded deep underground or underwater with no ill effects, they may be used when very large excavations are needed on a construction job.

—

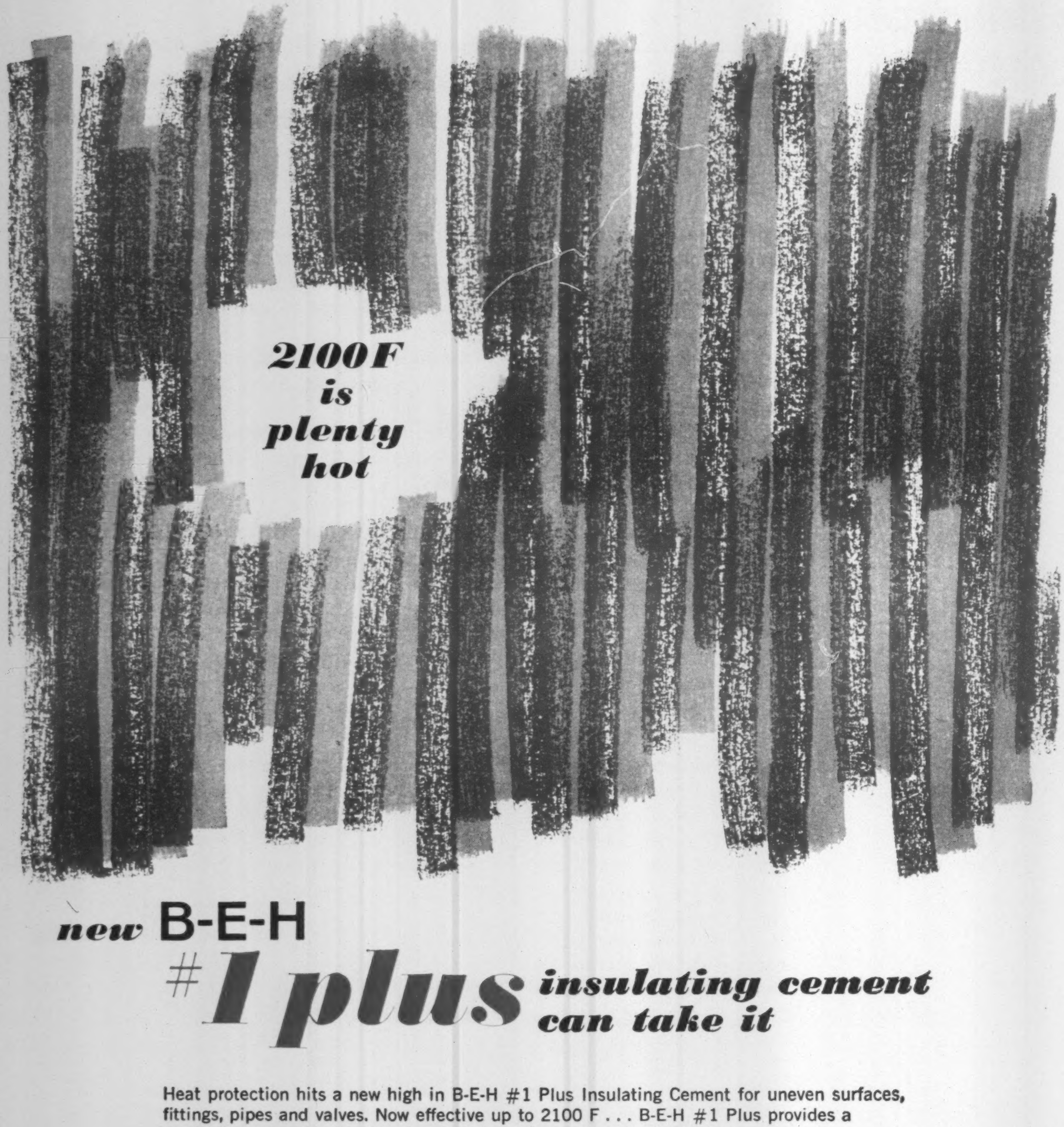
- **Funds for construction of the two-mile-long accelerator at Stanford University will be forthcoming before Congress quits for the year.** There was some doubt about congressional approval as an aftermath of the bitter debate that resulted in rejection of power generators for the huge nuclear reactor at Hanford, Wash. Hanford proponents suggested that they might kill all Atomic Energy Commission construction funds in retaliation. Calmer heads prevailed, however.

  It now is certain that AEC will get all its construction money ($276.5 million) except Hanford. The largest sum by far in the authorization bill was $114 million to build the long-delayed Stanford accelerator. The final figure in the pending appropriations bill may not be the full amount—but it will be enough to get Stanford started.

—

- **The Blatnik subcommittee is planning public hearings into alleged irregularities in highway right-of-way purchases in Massachusetts.** A lengthy preliminary investigation by the subcommittee staff is nearing an end, says Chairman John A. Blatnik (D., Minn.), and public hearings may start in late November or early December—no later, in any case, than early January.

  Republican subcommittee members have been pressing for more than a year for an inquiry into what they term "fraud and graft" by Democratic officials in Massachusetts. This, of course, is President Kennedy's home state. GOP members originally sought hearings shortly after Mr. Kennedy's Presidential nomination in July, 1960. They have accused subcommittee Democrats of dragging their feet for political reasons and charged that the President ordered a "whitewash." Representative Blatnik has denied both charges.



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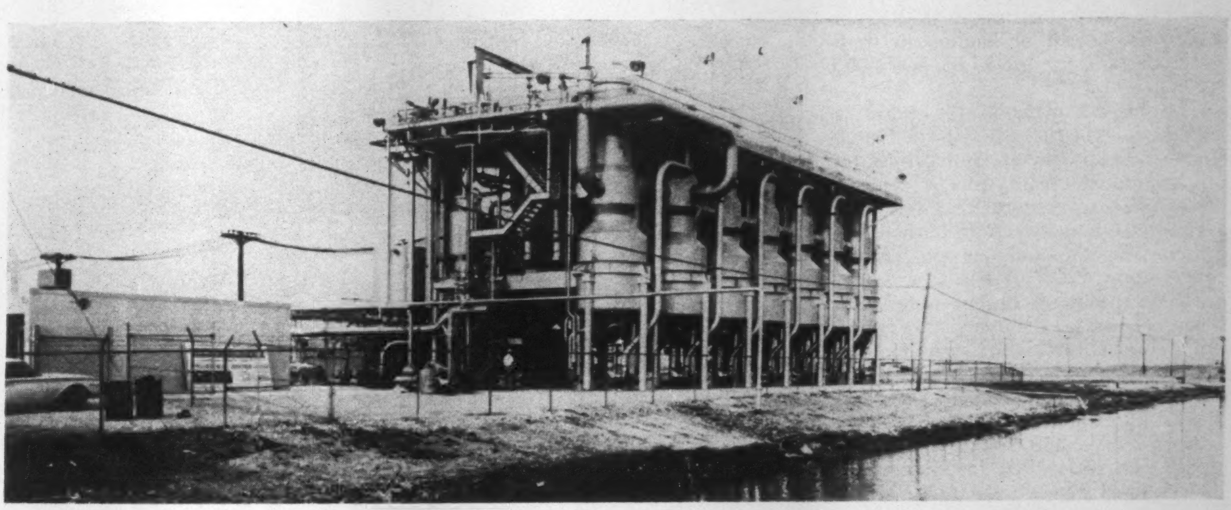


Desalting: Boon or Boondoggle?

Congress came to terms with itself last week on what a saline-water program is worth to the U. S. for the next few years, but the decision doesn't do much to resolve the general disagreement and confusion outside Congress.

The program is variously regarded as everything from a great hope to a complete boondoggle.

And little wonder. The public has been bombarded for the last few years with a welter of figures ranging from 10 cents to $3 and more, all purportedly representing the cost of making a thousand gallons of fresh water from salt water. And a reader could take his pick of statements like these:

From the American Water Works Association: "Even the cheapest desalted sea water is on the order of 20 times as expensive as fresh water."

From President Kennedy: "No water resources program is of greater long-range importance than our efforts to find an effective and economical way to convert water from our oceans into water fit for consumption in the home and by industry."

From a speech by a desalting-equipment manufacturer: "A scientific pipedream."

Whatever the sentiment among the citizenry, the U. S. is in the saline-water conversion field in a fair-sized way.

The Senate and House last week passed and sent to the White House a bill authorizing the Interior Department to spend $75 million in the next six years on saline-water research and development. This, in effect, steps up the size federal program from less than $1 million a year to a figure of $12.5 million a year.

The government program gets a warm welcome from some quarters, where enthusiasm is understandable. OSW has 50 companies under contract for research and development work ranging in cost from $1,000 to $150,000.

But the welcome is not universal.

The government program is largely a waste of taxpayers' money, believes William Vandersteel, president of Weir Chicago Bridge, a designer and builder of seawater distillation plants. The attendant unrealistic optimism and wild claims bedazzle potential customers and make it tough when a down-to-earth company like Weir has to tell them the true cost of distilling seawater, says Mr. Vandersteel.

"No matter what process is used," Mr. Vandersteel says, "desalted sea water will never be cheap when compared to conventional water supplies." Production costs will drop further, but inherent thermodynamic limitations will keep costs well above those of conventional supplies, he stresses.

Another long-established distilling equipment maker, Aqua-Chem, Inc., formerly Cleaver-Brooks Special Products, Inc., takes a dim view of some of the publicity about desalting. "Much being written and reported in the field of seawater conversion today borders on half-truths and even the fictional," says William M. Carpenter, Aqua-Chem's vice president in charge of public relations. "This misleading information is causing great confusion and is projecting a completely erroneous picture."

One aspect of the "erroneous picture," the frequent comparisons of real or hoped-for production costs of desalted water with the delivered cost of water from conventional sources, rouses the indignation of the American Water Works Association. The neglected costs of distribution and administration are the greater share of the total cost, says AWWA, an association of some 13,000 engineers, equipment suppliers and waterworks operators and executives.

The association says it surveyed 497 utilities recently and learned that the average cost of water to public water suppliers was 12.3 cents per 1,000 gallons, including distribution and administration. Only 5 cents of the total goes for treatment, including softening, says AWWA, and this is the figure to compare with the desalted water cost.

What it really costs to convert salt water to fresh can't be pinned down with any certainty, perhaps mainly because most of the few plants in existence operate under highly individual conditions.

OSW gives actual or expected costs of fresh water as $1 to $1.25 per 1,000 gal at its million-gal-a-day sea water distillation plants at Freeport, Tex. (photo above) and San Diego, Calif. (soon to start up); and 80 cents per 1,000 gal at its 250,000-gal-a-day electrodialysis plant for brackish water at Webster, S.D. (now in test operation). The agency computes water cost by a formula that includes allowances for operation, maintenance, debt service and

20-year amortization of capital investment but no distribution cost.

At least one U. S. town finds saline water conversion economic. Coalinga, Calif., now converts brackish groundwater by electrodialysis for $1.43 per 1,000 gal instead of hauling in fresh water by tank car for $7.05 per 1,000 gal.

The biggest plant in the world, a 2.25-mgd distillation plant in the Dutch West Indies island of Aruba, operates on by-product steam from a thermal power plant to produce fresh water for a reported price of $1.75 per thousand gallons. The island has no natural water supply.

OSW speaks of 50-cent water with bigger plants of the types now being built. Ionics, Inc., which manufactures and installs electrodialysis membrane plants, cites costs well below 50 cents at existing plants.

Both OSW and Ionics have questioned the costs cited for water from conventional sources. Dr. A. L. Miller, former head of OSW, said true water costs are sometimes disguised as taxes as a result of financing plants or improvements from general funds or by general obligation bonds. William E. Katz, of Ionics, cites hidden factors that he says raise the true cost of water in a Southern California area from the 33-42 cents paid on the water bill to $1.16-2.25.

The widely divergent views on salt water conversion sometimes seem to come from two distinct sides, one for it and one against it. Actually, the real difference of opinion lies mainly in the extent to which desalting appears economic or likely to become so. But the moderate view, in contrast to the poetic, sometimes comes off looking strongly anti. Thus an organization as broadly representative of all sides as the AWWA often has to accentuate the negative to keep things in balance.

However, AWWA keeps an impartial watch on developments in the field through its Saline Water Conversion Committee. The committee reported last spring that conversion of saline water, especially groundwater, might become economic to meet small demands at a distance from conventional sources.

Conversion of a local source of saline water would be cheaper at $1 per 1,000 gal, for example, if 100,000 gal a day were needed and a conventional source were 30 miles or more away. Similarly for 10,000 gal a day or less where a conventional source were 10 miles or more distant.

On the other hand, the committee reported that: "The costs of impoundment and transmission for large capabilities are so low that they constitute almost insuperable competition for saline water conversion."

PLEASURE PIER

Record-high waves pounded Galveston's new seawall, but did

Gulf, Midwest Tally

While the Gulf Coast and Midwest dig out and dry out from Hurricane Carla, engineers are assessing a few points the storm made in passing. Buildings and new floodworks performed well. Bridge damage from high water caused some second thoughts. And many thoroughly soaked towns that have never considered themselves in the hurricane belt before now have new rainfall records for future drainage design.

Waves riding tides 11 to 12 ft above normal were easily blocked by Galveston's new 18-ft seawall. The wall, topped by a 2-ft-thick roadway, is 15.6 ft above mean sea level. It sits on a 5-ft concrete cap supported by piles going down 42 ft to Beaumont clay. Curved to break up wave action, the wall is protected by a 59-ft-wide toe of 3-ft-thick concrete and granite riprap.

Industrial buildings weathered the storm well. Gulf Coast oil refineries lost little but production time and this only because employees left the area. Most were back on stream after two days.

Oil product shipments, however, were delayed because shipping docks remained under water at many points for several days after the plants were reactivated. Humble Oil Co. had three short crude oil lines torn up between Harbor Island and its Corpus Christi plant.

Offshore oil installations came through in relatively good shape. One $8-million drilling barge broke loose, but it was found little damaged drifting off the Louisiana coast.

Typical of the situation among industrial plants along the Texas coast was the Dow Chemical Co. operation at Freeport. The $750 million complex suffered some flooding but no wind damage. Plants engineered to withstand 125 mph winds saw gusts no worse than 100 mph.

One Dow plant was flooded to a depth of 14 ft when a leak boiled up under the valves that control sea water flow to the Ethyl-Dow plant. Another plant took 4 ft of water when the sea topped the 18-ft municipal levee.

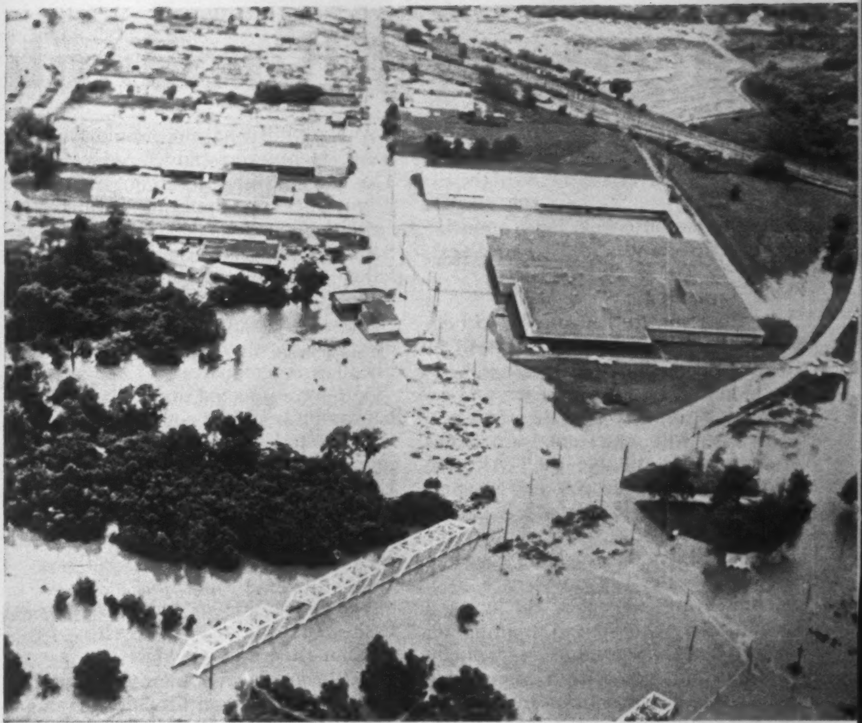
Leland I. Doan, Dow president, estimated that losses would be limited to $1 million in unproductive labor and $1 million in cleanup costs.

The 2¼-mi Port Lavaca Causeway, still under construction, received some damage from the bridge it is replacing. All but 3,000 ft of the old wooden causeway washed out, sending debris up under the 60-ft precast concrete spans of the nearly completed new bridge. At least two caps and three of the 194 spans will have to be replaced. Several other spans displaced can be jacked back into position.

Earthwork approaches on the seaward side of the bridge were washed out. All repairs will set completion of the causeway back 120 days, according to R. B. Alexander, bridge engineer for the Texas Highway Department. The causeway elevation is only 10 ft, putting it under water at the height of the storm. The decision not to go higher was made because of difficulty in maintaining earthwork approaches. "If we had to do it over again," said Mr. Alexander, "we'd go higher."

As the winds abated and the storm

little damage.



Water came in from the bay to flood downtown Galveston.

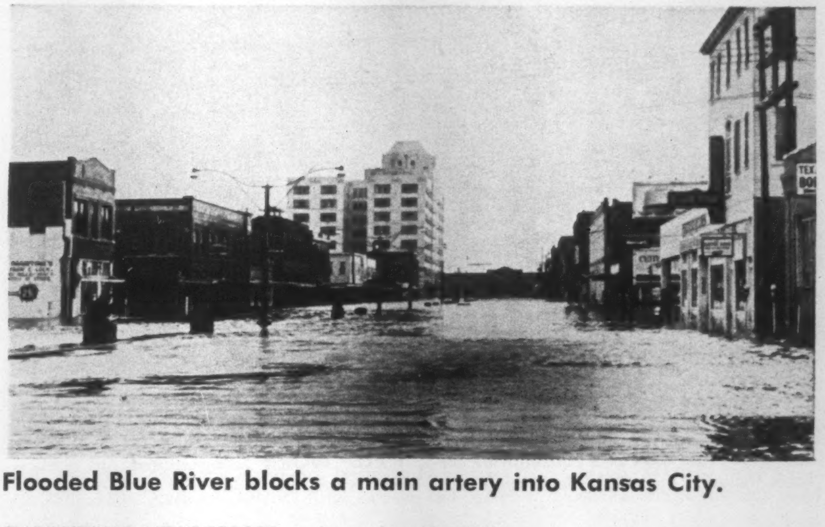
Carla's Toll

moved northward, many communities found they had a new storm of record on their books. Rains up to eight inches sent flood waters rising in Oklahoma, Kansas, Missouri, Nebraska, Iowa, Illinois and Wisconsin. In Kansas City, residents found that danger came not from the nearly tamed Missouri River at their front door, but from the small Blue River on the city's eastern edge. This little tributary swelled far out of its banks in a flash flood following the rains.

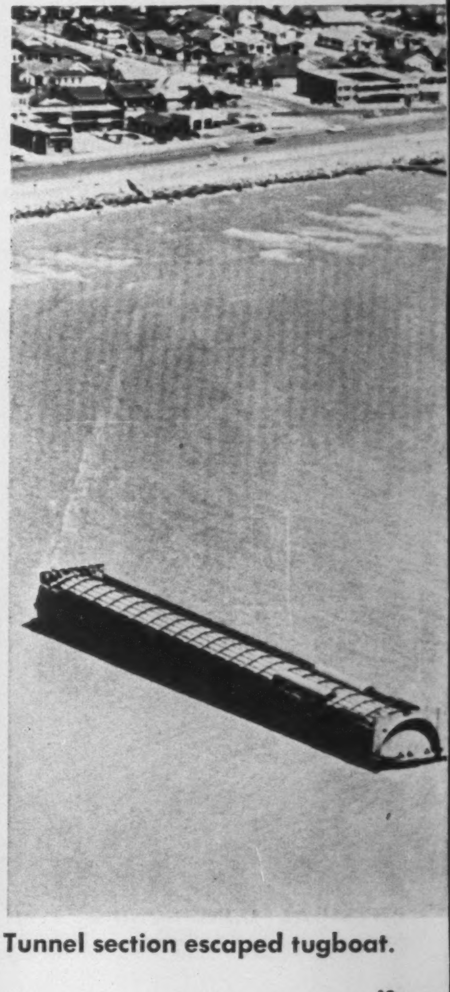
Five inches of rain in Chicago flooded 3,000 basements and forced the city's sanitary engineers to open the locks at the mouth of the Chicago River, reversing its flow back into Lake Michigan for the first time since 1957. The city pours sewerage into the Chicago River and gets water from Lake Michigan. Water engineers said that they found no increase in pollution at the city's water intakes as a result of four hours reversal of the river.

At sea, two prefabricated tunnel sections of the Chesapeake Bay Bridge-Tunnel were ripped from their towboat while being floated from Orange, Tex., to Norfolk. Each steel and concrete section, nearly 300 ft long and weighing 12,000 tons, had been sealed at both ends.

One of the sections drifted 200 miles to run aground on the beach at Galveston. The other was still adrift somewhere in the Gulf of Mexico at the end of the week.



Flooded Blue River blocks a main artery into Kansas City.



Tunnel section escaped tugboat.

Peace Corps Roadbuilders Are All

By Eugene J. Schreiber

Next weekend (Oct. 1) we'll be in Tanganyika.

It's been an intensive three months' training—two months in El Paso, Tex., and this month in Puerto Rico.

We're oriented. We're ready.

We are going to Tanganyika to help build roads. We are not being sent as crusaders for democracy; we are not being sent as budding missionaries; and we are not being sent to advertise America.

Africans will question us about America, and, naturally, we'll welcome the opportunity to answer. But it won't be with a pat Peace Corps line of any sort. Each of us has his own thoughts about any subject on which we might be questioned by the Tanganyikans.

Representing 23 states, the original 43 volunteers who started training on June 26 have backgrounds as graduate engineers and geologists, engineering students who decided to interrupt their educations and men with surveying experience. The youngest of us is 20; the oldest is 34.

***Eugene Schreiber** is sort of an alumnus of ENR, having spent a two-month training period here in 1960 before joining the editorial staff of our sister publication, Construction Methods and Equipment. He is 24, a Purdue graduate who served as a lieutenant in the Corps of Engineers.*

We are not what one would typify as being technically trained young men. The range of interests among this group is fantastic. The doubting Thomas who views engineers as having dull, single-track minds needs only meet these fellows to dispel such thoughts. Practically all are as well-read and as knowledgeable in government, history, philosophy, politics, and world affairs as top liberal arts graduates.

We were selected on the basis of our backgrounds and an eight-hour examination given last May. On June 26 we reported to Texas Western College in El Paso. For eight weeks we trained 66 hours a week—from 7 am to 9 pm Monday through Friday and 7 to 5 each Saturday.

- **Tough training**—A typical day in El Paso went something like this:

6 am—Rise and breakfast.

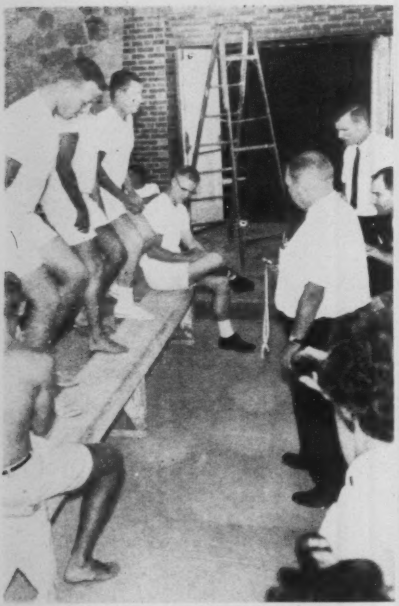
7-10 am—Area Studies. During this daily session an anthropologist and a historian, both of whom have lived in Tanganyika, instructed us in the country's cultures, tribes, politics, religions, agriculture, geography, history, customs. All our instructors throughout the El Paso phase were experts in their fields and were drawn from colleges throughout the U. S.

10 am-noon—Medical Instruction, World Politics Discussion, or American Studies Discussion. Doctors from the University of Texas gave us a thorough background on the variety of diseases found in Tanganyika—from sleeping sickness to schistosomiasis—and how to prevent them. In the group discussion periods we analyzed the writings of Huxley, Freud, Plato, Mussolini, Ghandi, Thoreau, Mill, Marx, Lenin, and a good many others (which were required reading prior to class). We examined situations such as segregation, American family life, democracy, foreign relations, and juvenile delinquency.

1-5 pm—Technical Training. All the volunteers were in one of three categories: civil engineering, surveying, or geology. Prof. Russell Brinker of Texas Western ran the program for surveyors and civil engineers. At the end of four weeks, the five geologists in training under Prof. William Strain of TWC and Mr. Harkins of Tanganyika were transferred to Llano, Tex., where they could better study hard rock conditions similar to those in Tanganyika. The eventual Africa-bound group is to be made up of five geologists, 20 surveyors, and four civil engineers.

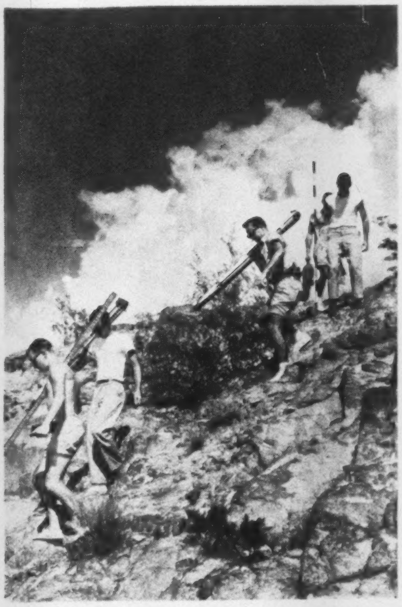
- **Field and office work**—At Texas Western the surveyors were broken down into two groups, one more advanced than the other, in order to speed up training for those volunteers with more extensive backgrounds. By the end of the eight-week program each group had surveyed

. . . After intense training in Texas and Puerto Rico



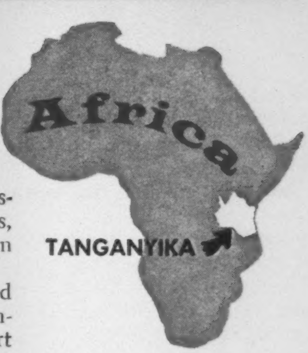
PHYSICAL CONDITIONING went heavy on swimming and mountain climbing.

DEMONSTRATION of earthmoving machines included graders, loaders, scrapers.



FIELD WORK concentrated on surveying, which the group will do and teach.

Set for Tanganyika



complete roads in the field—from preliminary lines to slope-staking.

As office work, the surveyors brushed up on cross-sectioning, drawing profiles, contour maps, mass diagrams, computing earthmoving, haul distances, costs, studying photogrammetry methods, running soils tests, making traverse computations, and designing horizontal and vertical curves.

In the field, under Robert Colthorp of Austin, Tex., the surveyors made sun and polaris observations, instrument adjustments, and carried out profile leveling, cross-sectioning with hand levels, turning angles with theodolites, taping, slope-staking, and culvert selection.

Meanwhile, the civil engineers worked with Prof. John Focht of U. of Texas. (Six graduate CE's made up this group, and four more were in the surveying category.) The engineer group reviewed surveying, culvert design and location, drainage computations, timber bridge design, photogrammetry and highway design. A representative from the Portland Cement Association was called in to cover concrete design, as was an Armco man to detail steel culverts.

A half-dozen afternoons were spent on local highway construction sites observing construction techniques. On one afternoon we visited concrete and asphalt plants. We spent five afternoons in the El Paso soils lab of the Texas Highway Department, where we ran density and plasticity tests, tested asphalt briquettes and concrete samples, and received thorough instruction on soils.

The local Caterpillar dealer presented us an all-day demonstration of earthmoving. The surveyors also took part in the afternoon half of this session, which was devoted to the operation of motor graders, front-end loaders and scrapers.

5-6 pm—Physical Training. This period, varying each day, consisted of running cross-country through the Franklin Mountains, going through calisthenics, and playing soccer, basketball, and tennis.

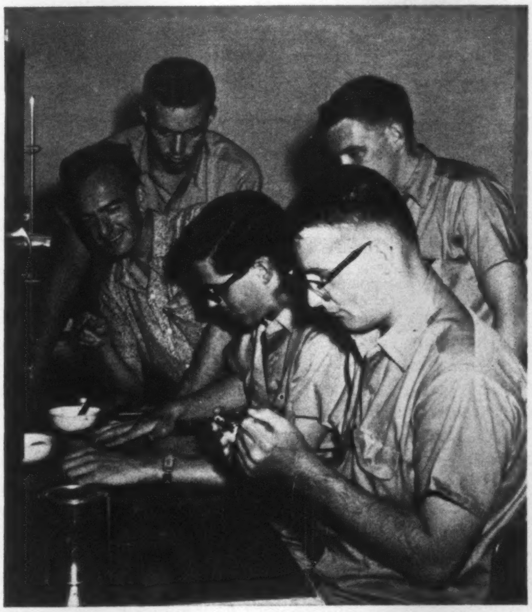
7:30—9 pm—On Monday, Wednesday, and Friday we played water polo, and on Tuesdays and Thursdays we participated in discussions of World Politics and American Studies.

While at Texas Western we were housed and fed in Miners Hall, the school's athletic dorm. Besides free room and board, we received a $2 a day allowance. In Tanganyika we will receive from that government free housing and a living allowance of 65 pounds a month ($182). Upon our return to this country, the U. S. government will give us a $75 bonus or readjustment allowance for every month of service, making a total of $1,800 for our two-year stints.

After a seven-day vacation following the El Paso training stage, on August 28 we reported to Washington, D. C., where we attended a reception given us (and the Peace Corps volunteers headed for Ghana) by President Kennedy. After a sightseeing tour of Washington, we traveled to New York and visited the United Nations as guests of Adlai Stevenson. And then on Sept. 1 we flew to Arecibo, Puerto Rico to the Peace Corps Training Center located here.

• Getting the feel—Here in Puerto Rico we have been continuing our technical training as well as going through tropical living, first aid practice, physical conditioning, and adjusting ourselves to working with non-English speaking people. We're roughing it in three-man tents in the rain forests and rugged mountains.

On Oct. 1 we are scheduled to arrive in Tengeru, Tanganyika—at the foot of Mt. Kilamanjaro—where we will attend the British Natural Resources School for seven weeks. The prime objective



LAB WORK was done at a Texas Highway Department soils laboratory. Author Schreiber is the man in the center.

CLASS WORK went on into the night with group discussions of Tanganyika, world politics, social problems, American history and literature.

there will be to learn Swahili, the major language spoken throughout the country. In El Paso we received only a familiarization course.

Located on the equator in east Africa, next to the Indian Ocean, Tanganyika is bounded on the north by Kenya and Uganda, on the west by the Congo, on the southwest by Northern Rhodesia and Nyasaland and on the south by Portuguese East Africa. The country is roughly the combined size of France, Germany, and Belgium, or—closer to home—Texas, Arkansas, and Louisiana.

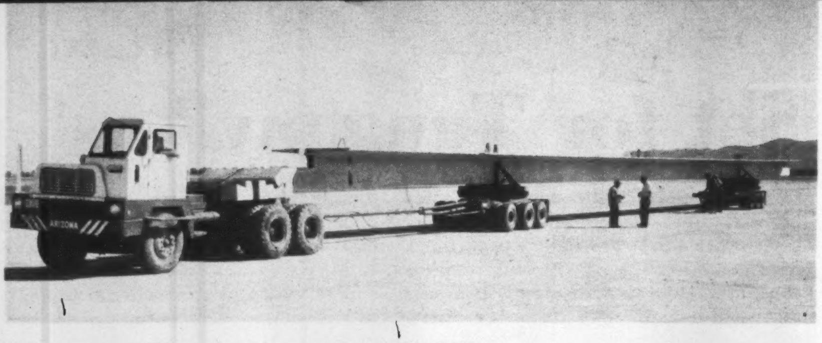
There are about 450 Americans, 20,000 Europeans, 80,000 Asians, and 9,000,000 Africans in Tanganyika. At present the country is a United Nations Trust Territory administered by the United Kingdom. In December, Tanganyika will become the 22nd independent African nation established since World War II.

- **And so to work**—After the course at Tengeru the Tanganyikan government will assign us to work in the country's nine provinces. We will be working for and will be paid by the Tanganyikan government. Our jobs fall into three classes.
- The geologists will map the country for the location of economically exploitable minerals.
- The civil engineers will start as assistant resident engineers working on construction of major trunk roads.
- The surveyors will first inventory the present rural road network then lay out and supervise the construction of feeder, farm-to-market roads. The 20 surveyors will work in pairs, each pair working with an African party. Each pair will be assigned vehicles and will be living in the bush a great deal of the time.

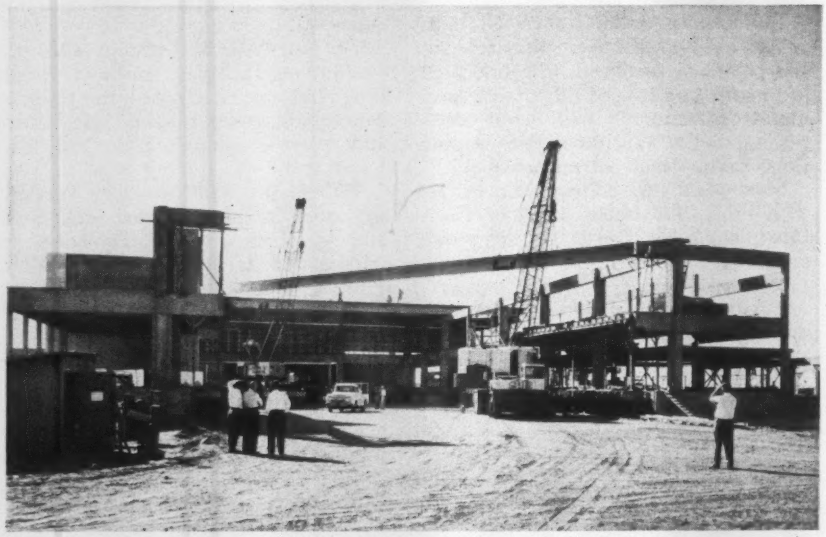
The feeder roads, which Tanganyikans vitally need to transport cash crops to market, will be built primarily by hand labor. At most, graders and D-4 tractors with angle dozer blades will be used. There will be no surfacing on the feeder roads. However, the surveyors will make final horizontal and vertical alignments so that in time the roads can be improved by stage construction. Included in the parties will be African trainees, who will be taught surveying on the job. At the conclusion of or two-year overseas term, these men will be qualified to take over where we leave off and continue the work.

To us, the next two years loom as the challenge of our lives. As Mr. Jack Chudley, Tanganyika's Chief Engineer of Roads and Airdromes, told us in El Paso, "I can assure you, you won't have been taught what you will learn, and it won't be found in textbooks . . . You're jolly lucky."

We agree.



Huge Prestressed Tees . . .



. . . Form Terminal Roof

Precast T-beams, 152 ft long, form the roof of a building at the new Phoenix air terminal. The beam design incorporates pretensioning and post-tensioning.

Three buildings are under construction—the ticketing wing, lobby building and operations building. The $2.5-million complex is scheduled to be opened early next year. Financing of the $10-million airport modernization is through a 1957 bond issue and a federal grant administered by the Federal Aviation Agency.

Twenty-two of the long, 8-ft wide T-beams roof the lobby building. They span 84 ft between supports and cantilever 34 ft at each end. At center span the units are 36 in. deep and have an 8-in.-wide web. Fourteen ½-in.-dia strands, strung in a vertical curve, and tensioned in the casting bed, prestress each tee. Post-tensioning, to compensate for the lightweight concrete topping, which varies from 2 to 10 in. in thickness, is applied through a cable composed of sixteen ¼-in. dia wires. This tendon runs the full length of 10 beams. In the other 12, post-tensioning is used only in the cantilevered sections. All tees have additional post-tensioning in the cantilevers.

The design called for 5,000-psi concrete mixed in 4-cu yd batches. Prestress was applied when the concrete reached 4,000 psi. A load cell enabled the force to be controlled within 250 lb.

Neoprene bearing pads between the precast roof tees and the cast-in-place supporting frame will allow for long-term shrinkage or rotation.

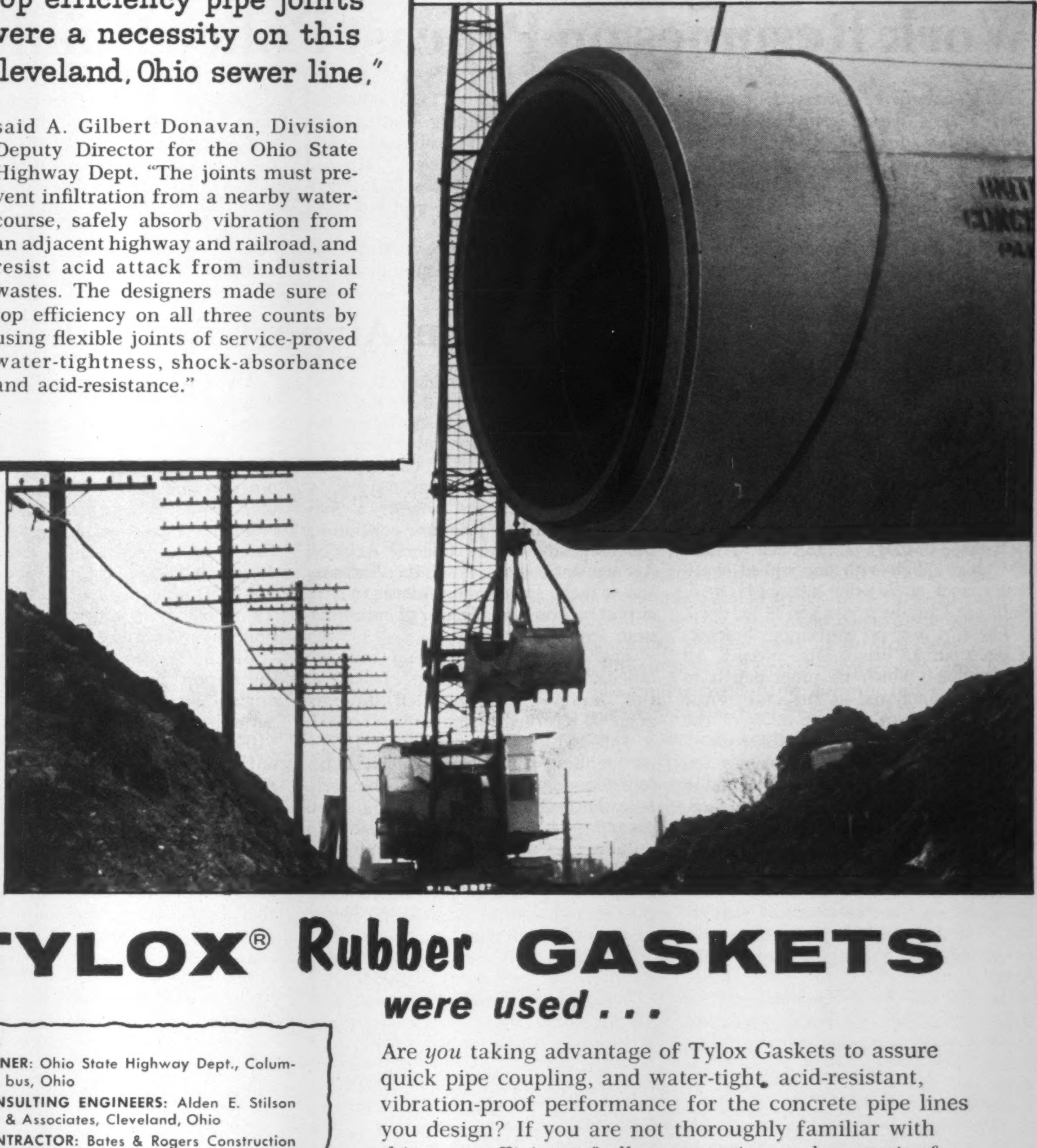
The 95,000-lb units were hauled 5 miles to the site on a tractor and a pair of steerable dollies. Two-way-radio cars directed operations on the highway. Two 60-ton truck cranes handled the beams in the yard and at the job.

The two-story lobby building is 240 ft long by 132 ft wide. Mechanical and air-conditioning equipment are housed in the basement. A bridge connecting the lobby and operations building crosses a service road between aprons on opposite sides of these structures.

Lescher & Mahoney, Ltd. and Weaver and Drover, both of Phoenix, are the architects; Walter E. Riley is the structural engineer, with T. Y. Lin & Associates of Van Nuys, California, as consultants on the prestressed design. The general contractor is Chanen Construction Co. Inc., and Arizona Sand and Rock Co. of Phoenix supplied the T-beams.

"Top efficiency pipe joints were a necessity on this Cleveland, Ohio sewer line,"

said A. Gilbert Donavan, Division Deputy Director for the Ohio State Highway Dept. "The joints must prevent infiltration from a nearby watercourse, safely absorb vibration from an adjacent highway and railroad, and resist acid attack from industrial wastes. The designers made sure of top efficiency on all three counts by using flexible joints of service-proved water-tightness, shock-absorbance and acid-resistance."



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Tests on controversial post-tensioned slabs completed . . .

Work Resumes on Precast Police Building

After extensive testing by consultants, Mayor Richardson Dilworth of Philadelphia directed Sovereign Construction Ltd. to reinforce some of the work done on the Police Administration Building and then finish the project. The city had ordered the general contractor to stop construction of the $4.3-million, precast concrete building last month because some key prestressed members were defective.

The 4-story building consists of two circular wings connected by a third, curved wing. The precast walls of the structure are supported at second-floor level on the cantilevered ends of pie-shaped ribbed slabs post-tensioned with high-strength steel bars (ENR Oct. 13, 1960, p. 56). Structural deficiencies were discovered in four of these slabs.

Typically, a pair of interior slabs, each cast in wedges of 11½-deg arc and 28-ft span, align with one ribbed cantilever panel of 22½-deg arc, 12-ft span. Slabs are 3 in. deep; ribs are 34 in. deep.

The ribs bear on continuous brackets of deep curved beams, also precast. All the tendons, which tie inner panels to outer, are anchored at the end of the cantilevered span. About 60% of the tendons extend through both spans.

All failures occurred in the area immediately adjacent to the tendon anchor plates, reported Robert L. Geddes, architect, of Geddes, Brecher, Qualls and Cunningham, designers of the project.

One local shear-type failure took place during the final stage of tensioning. The failure shear plane practically coincided with a line separating white finish concrete used for the exposed soffit and the gray concrete used for the rest. The damaged area was cleaned out and patched with 6,000-psi concrete. Tendons then were retensioned to full load, 130,000 lb, and pressure grouted.

The other three failures were compression type. The cause appeared to be omission or misplacement of reinforcing bars, ties and stirrups, Mr. Geddes reported. Repairs to these beams included addition of reinforcing steel.

Nevertheless, the city, fearing the repairs might be inadequate or that other beams might be defective, ordered construction halted (ENR Aug. 24, p. 17). The city engaged James R. Libby of San Diego and Schupack & Zollman of Philadelphia, as consultants to investigate the condition of the structure. Sovereign, in turn, employed Ross H. Bryan of Nashville and Jacob Feld of New York City as consultants.

Last week, Mayor Dilworth concluded that "the building is structurally sound due to the unusually high safety factor of the original design." He said reinforcement was necessary to compensate for "some lack of uniformity of concrete strength."

The plan is to embed reinforcing steel in the concrete topping of the second floor. The original design called for a 2½-in. unreinforced topping.

Sovereign must pay for the reinforcement and also absorb whatever loss results because of the delay in construction, the mayor said. But Robert J. Frankel, president of Sovereign, said "the law would determine" whether the company will have to foot the bill.

Long-Term Airport Aid Killed

Congress has dealt a blow to airport planners and builders and to the Kennedy Administration by extending the airport aid program for only three years and by putting it back on a pay-as-you-go appropriations basis.

The President had sought a five-year, $375-million program, continuing the authority of the Federal Aviation Agency to borrow from the Treasury and to make grant commitments to local airport sponsors in advance of appropriations from Congress.

The House, in a flare-up over so-called "backdoor spending," balked at this, however, insisting that the program be returned to the basis on which it operated between 1947 and 1955—no spending commitments allowed before Congress actually votes the cash. It authorized a three-year, $325-million program, of which no more than $75 million may be spent in any one year.

The Senate originally approved the President's proposal but subsequently gave in and went along with the House in view of the impending adjournment of Congress and the adamant House stand on the method of financing.

Sen. A. S. Mike Monroney (D., Okla.), chairman of the aviation subcommittee, expressed the Senate view when he called the return to a system of annual appropriations "a regressive and unfortunate decision." But it was a choice of either accepting the House bill or having no airport aid program. The previous program expired June 30.

The Administration bill had received strong support from the Airport Operators Council, Associated General Contractors, Conferences of Mayors and County Officials and other groups interested in airport construction. They argued that the advance funding concept, with federal aid assured for the next five years, was essential to permit orderly planning for airports which require at least a two-year lead time, and to provide sufficient time for arranging local financing. The program has operated on this basis since 1956.

The final legislation makes only one concession toward permitting long-range planning. It authorizes a two-year appropriation of $75 million annually for the first two years of the program and permits an advance one-year appropriation next year for the program's final 12-month period. The House followed this up by enacting a second bill actually appropriating the full $150 million for the first two years. The Senate is to approve the appropriation this week.

But herein lies a major ranger—from the airport builder's standpoint. The original airport program passed in 1946 authorized a maximum appropriation of $100 million each year. But from then until 1956—the period when the program was first operated on the basis of annual appropriations—the maximum of $100 million was never obtained in any year.

From a high of $42.8 million in the first year, annual appropriations fluctuated widely and generally downward to a low of zero in fiscal 1954. With federal aid so uncertain, planning by states, cities and counties became virtually impossible.

Under long-range contract authority, however, FAA could operate up to the full amount authorized and Congress would have little choice, when the bills came due, but to make good on them.

Because Congress acted so late this year, the airport aid program already is well behind schedule. FAA is now obtaining from airport sponsors their requests for funds for specific projects in the current fiscal year, which began July 1. These will be screened on the basis of eligibility for aid, priority of projects and the amount of money available to each state.

FAA already has announced the amount of money each state is to receive. This is fixed on the basis of population and other factors. But the Agency probably will not be able to say until January what specific projects within each state will get federal aid.

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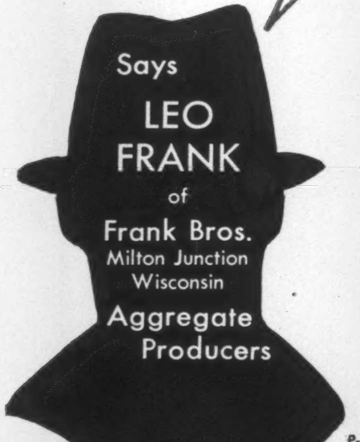

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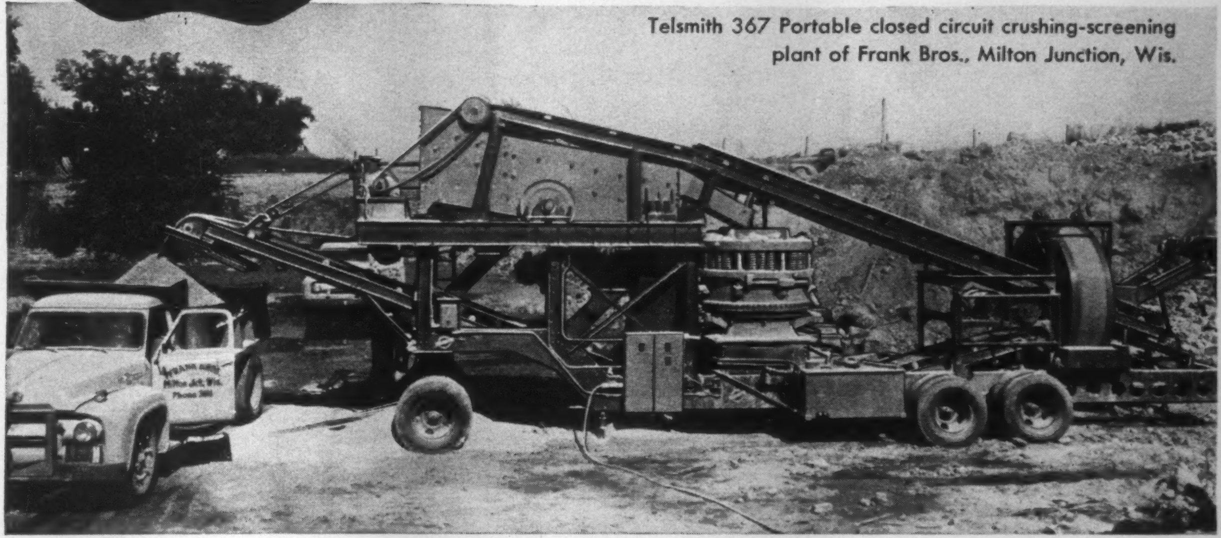

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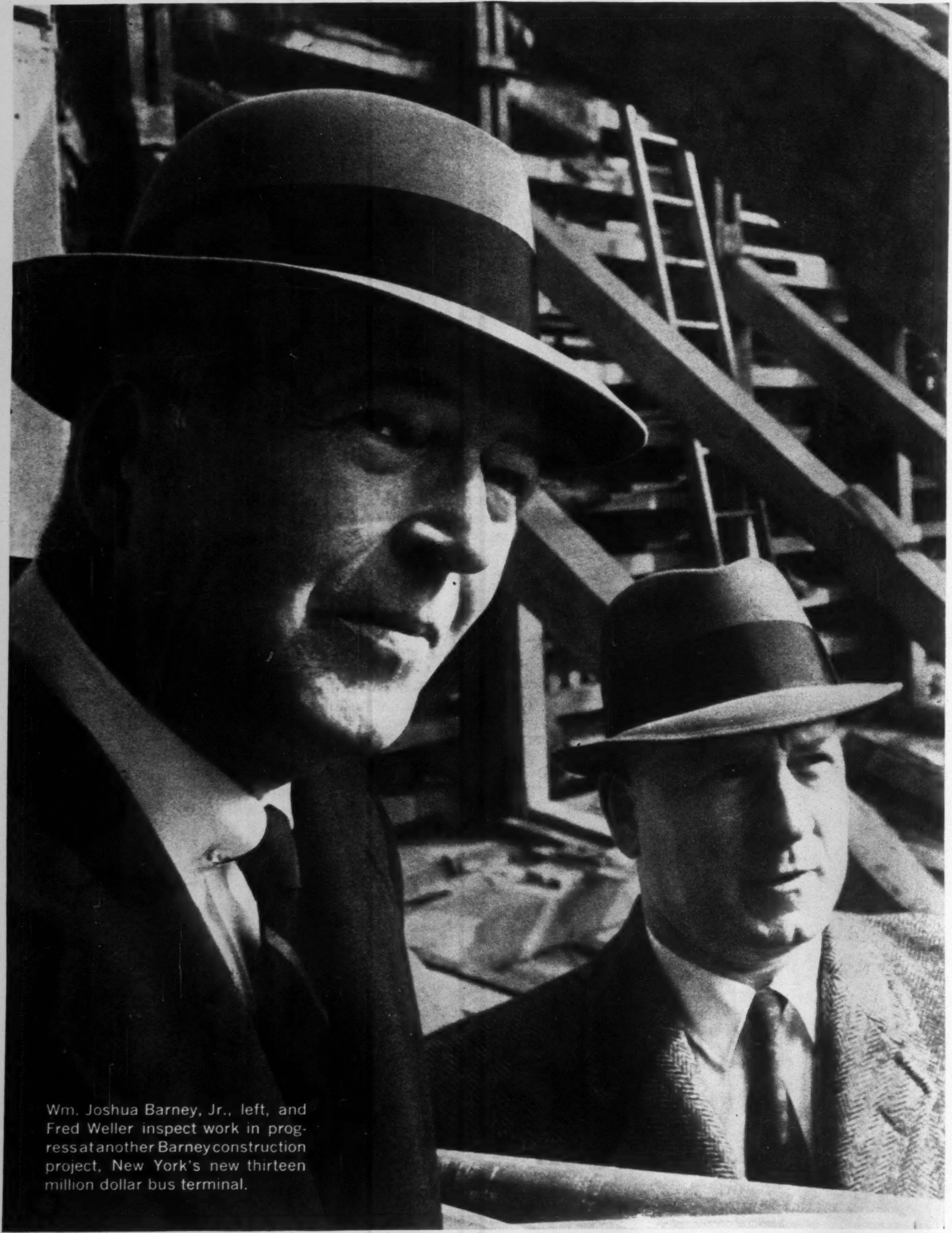
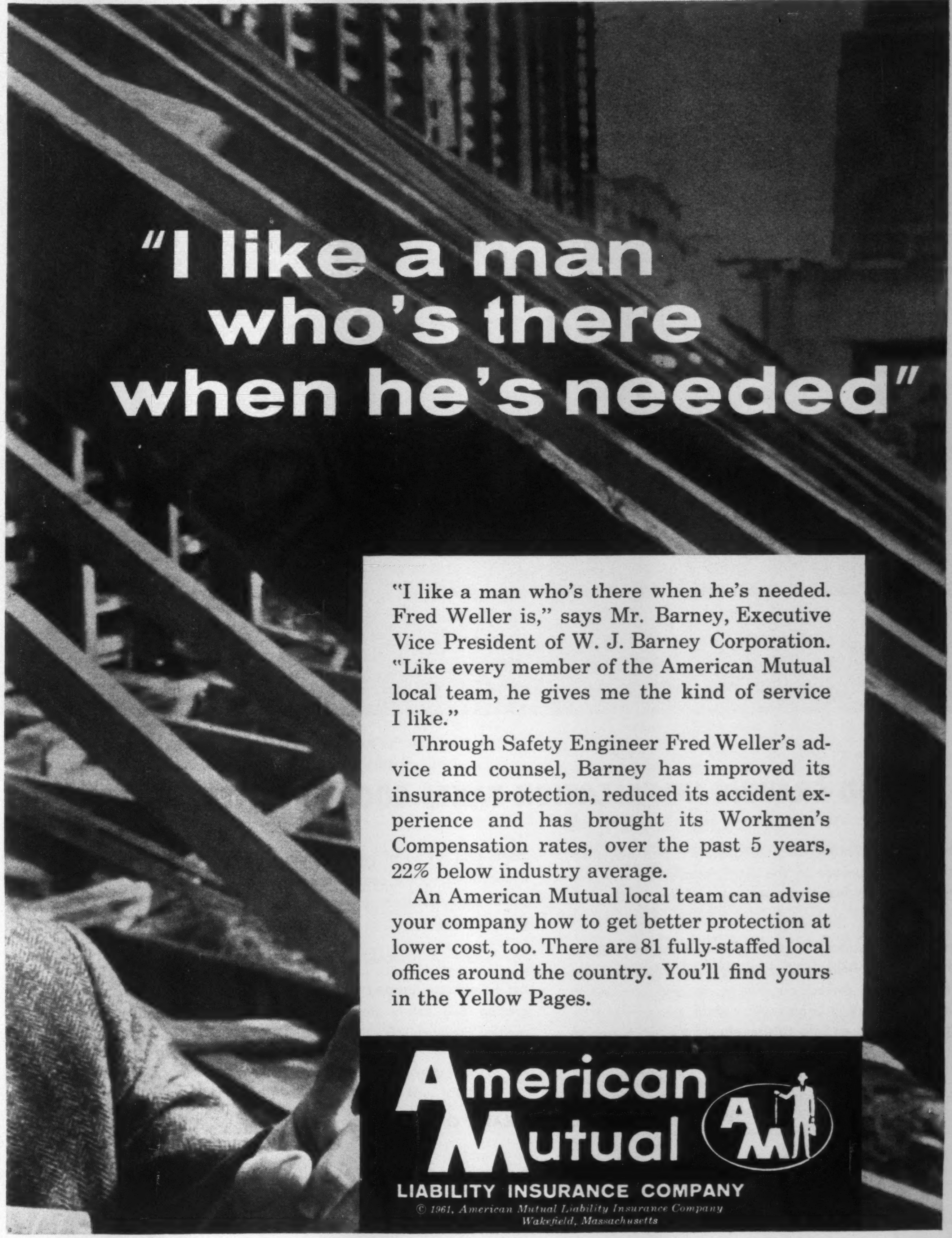


Wm. Joshua Barney, Jr., left, and Fred Weller inspect work in progress at another Barney construction project, New York's new thirteen million dollar bus terminal.



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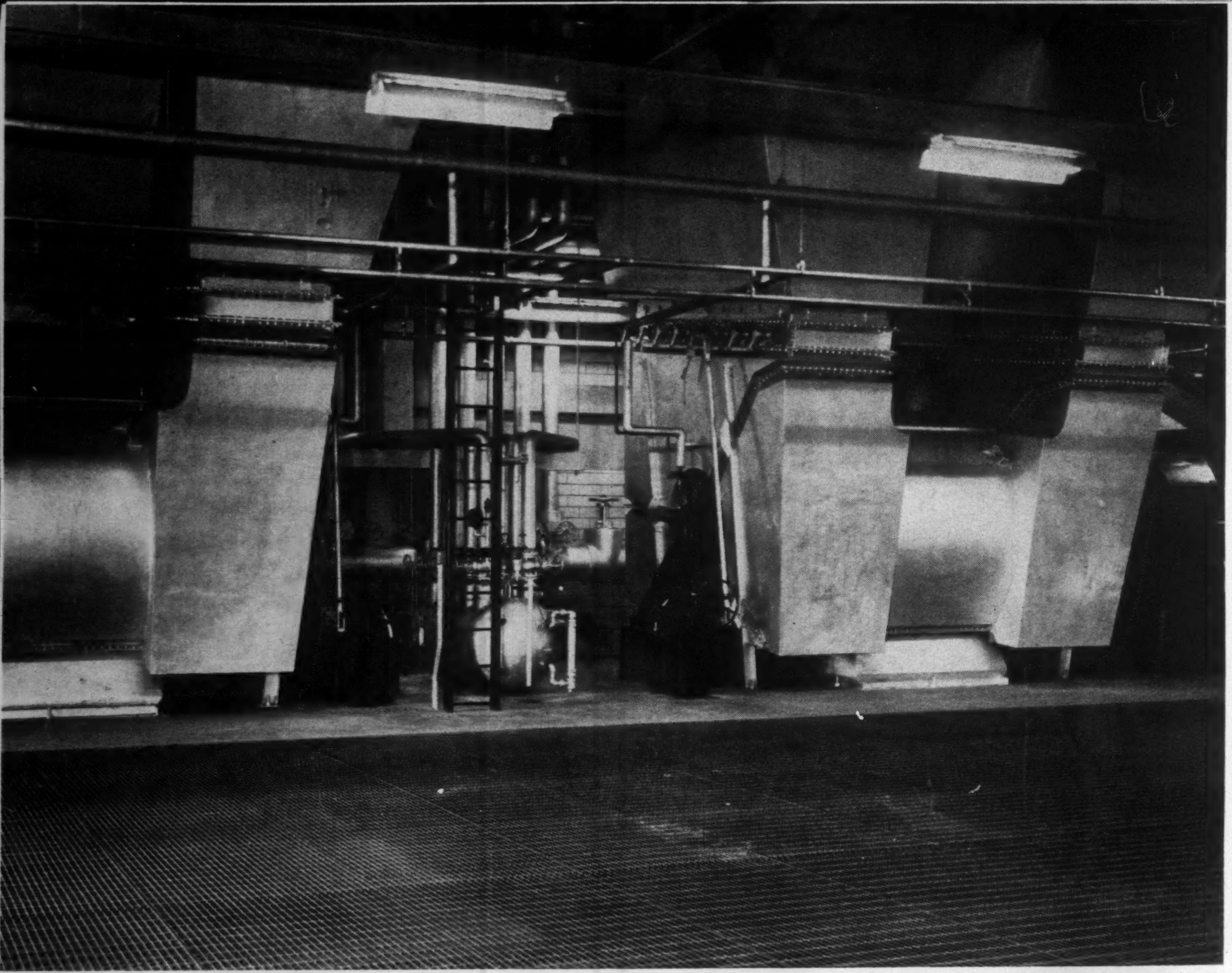

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CIRCLE 52 ON READER SERVICE CARD

ENR COSTS REPORT AND OUTLOOK

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Labor: Toughest Cost Problem

LABOR costs have powered the steep spiral in building and construction costs. Labor costs will probably trigger price increases for construction's basic materials—steel and cement—before long. And when there is a brief breathing spell for the cost-battered construction industry, it is almost always because the pressure of the annual round of wage increases has temporarily spent itself.

With such a breather just ahead, now is a good time to take a long look at wages, construction's toughest cost problem—now before the spiral starts all over again.

That's what this Third Quarterly Cost Report does. It presents a look at up-to-the-minute construction labor costs for a broad cross-section of the major construction centers of the U. S. It shows what unions are getting in the way of fringe benefits, plus the effect of this year's bargaining sessions on labor costs, now and in the year ahead. It gives a schedule of the automatic wage increases that are being written into more and more long-term labor contracts.

To put the construction wage picture in perspective, the report shows the relationship of wage data to other basic economic indicators—the cost of living, for example. Finally it presents construction labor costs outside the U. S.

In short, the pages that follow detail the present wage picture and its outlook. And, as usual, the outlook is for increases—less than in previous years, but increases nonetheless.

Once again, ENR's quarterly cost report underscores the fact that the only defense against increased cost per man-hour is increased output per man-hour. Achieving increased productivity remains the answer to this tough problem of increasing labor costs.

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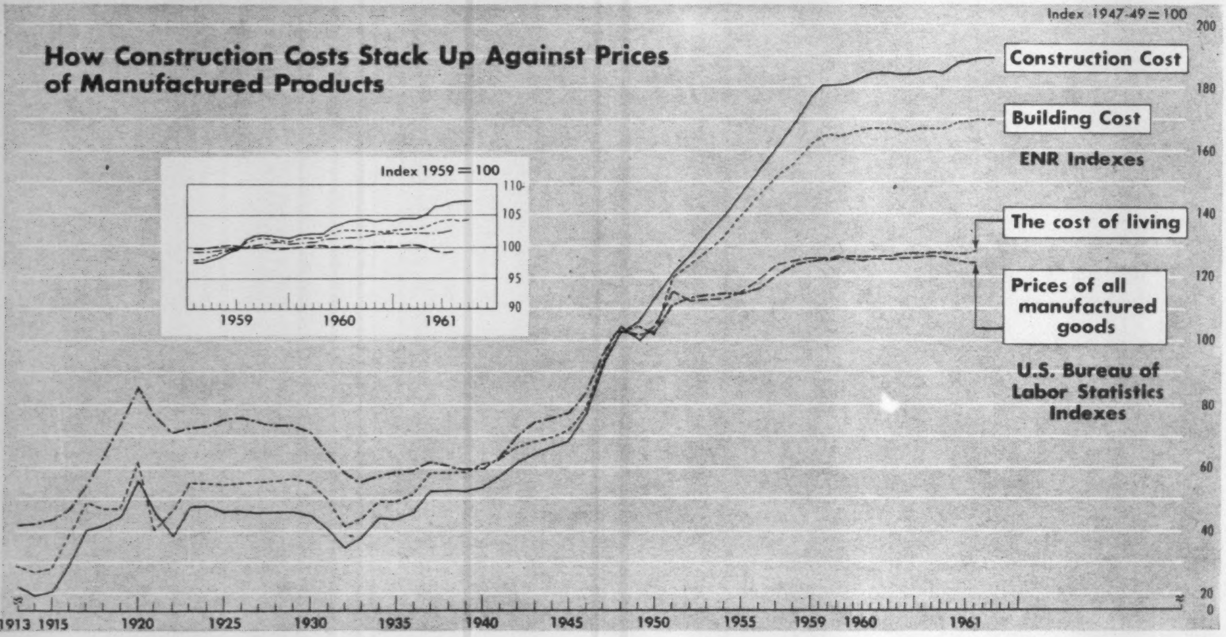
Costs Roundup—3rd Quarter



Productivity: The Key to Labor Costs

A glance at the chart above shows the growing gap between what construction men must pay for their essential materials and labor and what the nation as a whole pays for the manufactured essentials of everyday life.

It's quite a contrast. Starting with a base of 100 in the 1947-49 period, the manufactured products price index soon parted company with the Building and Construction Cost indexes. And year after year, the gap has widened, until today heavy construction contractors are paying $189.60 for the same amount of materials and common labor that $100 would have bought in 1947-49. It now costs building contractors $169.70 to get the materials and skilled labor that a $100 bill would have put on the jobsite in '47-'49. Yet a cross section of manufactured products tagged at $100 in the late Forties base period today costs only $124.80.

To see whether the growth of the chasm between what our industry must pay for its materials and labor and what the nation pays for the manufactured goods it needs might be slowing, ENR put its indexes and the BLS series on a 1959 = 100 base (see chart insert). The difference is even more startling. Manufactured goods worth $100 in '59 now go for only $99.50. But heavy construction contractors have to pay $107.20 for '59's $100 worth of materials and labor. And the materials and labor that a building contractor could have gotten for $100 then now wears a $104.30 price tag.

The finger of responsibility for the disproportionate rise in building and construction costs must point to labor.

Since January 1959, ENR price and wage averages show that structural steel's mill price has remained unchanged. Bulk cement costs only 1.3% more. Lumber prices have risen 3.3%. But common labor base wages and fringe benefits have soared 14.3%. Base rates and fringes for the three bellwether skilled trades, bricklayers, carpenters and structural ironworkers are up 12%.

Construction wage increases will be somewhat smaller next year than they were in '61. But this represents only a slewing down of the wage cost spiral, not a real break in it. Wishing for such a break is simply futile. And so is any idea that, in today's hotly competitive construction market, contractors will be able to raise their bid prices high enough to offset fully their increased costs.

The answer to the problem, as many successful contractors have discovered, continues to be tight management, all along the line.

What building contractors are doing is indicated by an average of four of the widely used contractors' price indexes shown in detail on page 69 (the Fruin-Colnon, Austin, Fuller, and Turner indexes). While these building contractors are paying $169.70 for 1947-49's $100 worth of materials and labor, they are billing their clients only $150.80 for a unit of construction they would have priced at $100 in the late Forties. Stepped-up productivity in the broad sense, including low profit margins and large "turnover" or volume, accounts for a large part of this gap between costs paid and prices charged.

Contractors' ability to match productivity to rising costs will be tested again in '62 when materials prices rise along with wages. For awhile, it looked as if this would be the case this year, but stable cement and steel prices and lower prices for lumber spared contractors cost pressure from this direction.

In 1962, however, higher cement prices are virtually certain (p. 81). And it's a good bet that next year will see the first rise in mill prices of standard structurals, if prices don't go up in the fourth quarter of this year, when steelworkers wages rise. An appeal by President Kennedy to hold the price line is being very coldly received by the steel industry.

ENR's preliminary forecasts for December, 1962, point to a value of 881.16 (1913 = 100) for the Construction Cost Index, 3.2% higher than it is now. The Building Cost Index should rise 2.2% between now and the end of '62, hitting 571.44 (1913 = 100).

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Max. End Reaction	2,860 lbs.
Weight	6 lbs. per ft.

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Max. Bending Moment	3,620 ft./lbs.
Max. End Reaction	1,760 lbs.
Weight	48 lbs.

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Max. sheave height	179'4"
Capacity range	2,640 to 14,040 lbs.
Hoisting winch	37.2 h.p.

Model 561

Max. tower height (at jib pivot point)	115'2"
Max. jib length	103'6"
Max. reach (from center of track)	107'9"
Max. sheave height	215'6"
Capacity range	3,190 to 18,700 lbs.
Hoisting winch	60 h.p.

Model 921

Max. tower height (at jib pivot point)	158'2"
Max. jib length	138'4"
Max. reach (from center of track)	144'1"
Max. sheave height	291'7"
Capacity range	4,400 to 23,100 lbs.
Hoisting winch	60 h.p.

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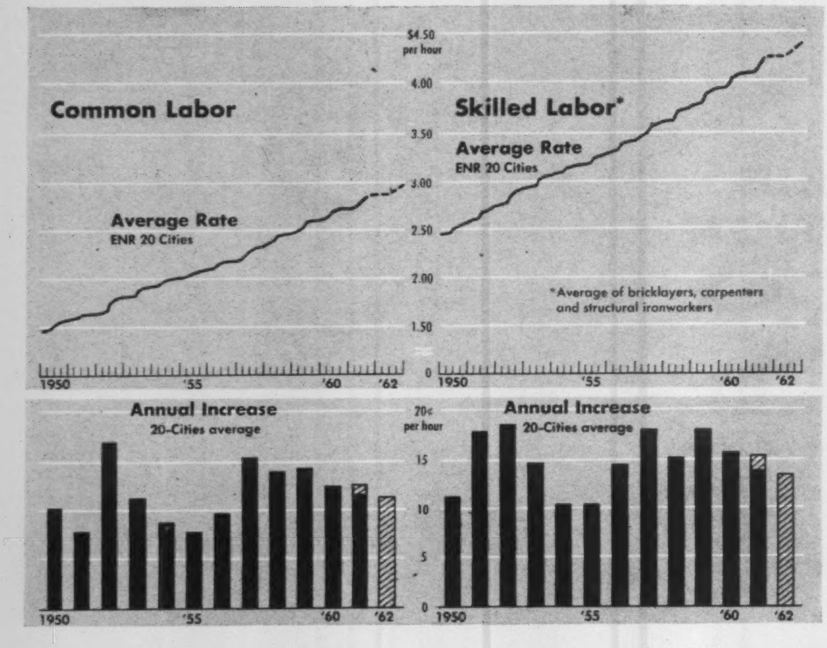


The 1961 wage story is almost written. Only a handful of automatic increases under long-term contracts are scheduled for the fall and practically all trades whose contracts ran out this summer have negotiated new agreements.

As of September 1, ENR's 20-cities average of hourly common labor wage rates and fringe benefits stood at $2.862, highest in history. The September 20-cities average of hourly rates for the three "key" skilled trades (bricklayers, carpenters and structural ironworkers) is a record $4.237, including fringe benefits. A few automatic increases this fall and raises under one or two contracts now being negotiated will put these wage averages right where ENR predicted they would be by this December, $2.87 for common labor and $4.25 for the three skilled trades (ENR Sept. 22, 1960, p. 59). This will mean average December '60-61 increases of 12.6 cents an hour for common labor and 15.3 cents for skilled workers.

These Wage Increases Are Automatic

	Common Labor ¢/hr.						Skilled Labor ¢/hr.								
	Building			Heavy Construction			Bricklayers			Carpenters			Structural Ironworkers		
	'61	'62	'63	'61	'62	'63	'61	'62	'63	'61	'62	'63	'61	'62	'63
Atlanta	....	15.0	10.0	....	15.0	10.0	*e*	....	....	*e*	....	....	*f*	....	....
Baltimore	....	*a*	....	....	*a*	....	5.0	*a*	....	....	*a*	....	....	*a*	....
Birmingham	....	10.0	10.0	10.0	10.0	15.0	....	....	....	....	10.0	15.0	....	6.0	7.0
Boston	....	....	....	....	....	....	....	....	....	....	15.0	....	....	5.0*d*	....
Chicago	....	....	....	....	....	....	....	*m*	....	....	*m*	....	....	*m*	....
Cincinnati	....	12.5	12.5	....	12.5	12.5	....	12.5	12.5	....	17.5	12.5	....	22.5	....
Cleveland	....	15.0	15.0	....	15.0	15.0	....	12.0	15.0	....	15.0	15.0	....	15.0	15.0
Dallas	....	....	....	....	....	....	....	*j*	....	....	5.0*k*	....	....	*l*	....
Denver	....	*a*	....	....	15.0	....	....	10.0	....	....	10.0	....	10.0	*a*	....
Detroit	....	*b*	....	....	*b*	....	....	*b*	....	....	*b*	....	....	*b*	....
Kansas City	....	12.5	12.5	....	12.5	12.5	....	12.5	....	....	12.5	....	....	12.5	12.5
Los Angeles	....	*b*	....	....	*b*	....	....	*b*	....	....	10.0	*b*	....	*c*	....
Minneapolis	....	10.0	....	....	12.0	*g*	....	10.0	....	....	10.0	....	....	13.0	....
New Orleans	....	*b*	....	....	*b*	....	....	*b*	....	....	*b*	....	....	*b*	....
New York	....	32.4	....	....	32.4	....	....	*m*	....	....	32.4	....	....	28.0	....
Philadelphia	....	*b*	....	....	*b*	....	....	*b*	....	....	*b*	....	....	*d*	....
Pittsburgh	5.0	17.5	17.5	*e*	....	....	7.5	22.5	25.0	7.5	22.5	25.0	7.5	22.5	20.0
St. Louis	10.0	20.0	....	10.0	20.0	....	....	15.0	20.0	10.0	20.0	....	10.0	20.0	....
San Francisco	....	*b*	....	....	*b*	....	....	*h*	....	....	*i*	....	....	*c*	....
Seattle	....	*j*	....	....	*j*	....	....	*d*	....	....	*j*	....	....	*n*	....

Contract expiration dates: •a 4/1/62 •b 5/1/62 •c 8/15/62 •d 7/1/62 •e no contract •f 9/1/61 •g 12/31/62 •h 9/1/61 •i 6/15/62 •j 1/1/62 •k 7/26/62 •l 4/10/62 •m 6/1/62 •n 4/20/62

Construction Wages in ENR's 20 US Cities . . .

COMMON LABOR, $/hr., inc fr benefits

(Building and heavy construction average)

	1932	1939	1946	1949	1950	1957	1958	1959	1960	1961
J	.45	.68	.95	1.42	1.49	2.21	2.37	2.50	2.64	2.77
F	.45	.68	.97	1.42	1.49	2.22	2.38	2.50	2.64	2.77
M	.44	.68	.99	1.42	1.49	2.22	2.38	2.50	2.64	2.77
A	.41	.68	1.00	1.43	1.49	2.23	2.39	2.51	2.65	2.78
M	.41	.68	1.02	1.43	1.51	2.26	2.41	2.54	2.68	2.82
J	.41	.68	1.03	1.44	1.53	2.29	2.44	2.55	2.71	2.84
J	.41	.68	1.06	1.47	1.54	2.30	2.46	2.60	2.72	2.85
A	.42	.69	1.07	1.47	1.56	2.33	2.47	2.62	2.73	2.86
S	.43	.69	1.07	1.48	1.56	2.33	2.47	2.62	2.74	2.86
O	.43	.69	1.07	1.48	1.57	2.33	2.48	2.62	2.74	....
N	.43	.69	1.08	1.48	1.58	2.34	2.48	2.62	2.75	....
D	.43	.69	1.09	1.48	1.58	2.34	2.48	2.62	2.75	....
Av	**.43**	**.68**	**1.03**	**1.45**	**1.53**	**2.28**	**2.44**	**2.57**	**2.70**	....

SKILLED LABOR, $/hr., inc fr benefits

(Bricklayer, carpenter, ironworker average)

	1932	1939	1946	1949	1950	1957	1958	1959	1960	196^{1}
J	1.15	1.43	1.70	2.35	2.46	3.46	3.63	3.78	3.95	4.12
F	1.11	1.43	1.73	2.35	2.47	3.46	3.62	3.79	3.95	4.12
M	1.11	1.44	1.74	2.38	2.47	3.46	3.63	3.80	3.95	4.12
A	.95	1.44	1.76	2.38	2.48	3.47	3.64	3.80	3.97	4.13
M	.96	1.44	1.77	2.38	2.49	3.49	3.65	3.82	4.00	4.16
J	.99	1.44	1.80	2.39	2.52	3.51	3.68	3.85	4.04	4.20
J	1.00	1.44	1.82	2.41	2.52	3.54	3.72	3.89	4.07	4.22
A	.98	1.44	1.83	2.44	2.54	3.58	3.73	3.90	4.08	4.22
S	.99	1.44	1.85	2.45	2.55	3.59	3.74	3.92	4.09	4.24
O	.98	1.44	1.85	2.46	2.57	3.60	3.75	3.92	4.09	....
N	.97	1.46	1.86	2.46	2.57	3.61	3.76	3.94	4.10	....
D	.98	1.46	1.87	2.46	2.58	3.61	3.76	3.94	4.10	....
Av	**1.02**	**1.44**	**1.80**	**2.41**	**2.52**	**3.53**	**3.69**	**3.86**	**4.03**	....

Construction Wages Over the Years

ENR average yearly wage rates in New York City

	Carpenters	Bricklayers	Bricklayers Helpers	Common Laborers	Structl. Iron wkrs
1874	$0.23*a*	$0.43*c*	$0.18*c*	$0.14*a*	......
1898	0.44*c*	0.50*c*	0.30*c*	0.14*b*	......
1907	0.625*c*	0.70*c*	0.375*c*	0.22*c*	$0.60*c*
1913	0.625*c*	0.70*c*	0.375*c*	0.225*c*	0.625*c*
1929	1.55*c*	1.84*c*	1.115*c*	0.985*c*	1.81*c*
1932	1.33*c*	1.47*c*	1.00*c*	0.645*c*	1.675*c*
1938	1.75	1.885	0.997	0.913	1.925
1939	1.75	1.893	1.031	0.913	1.925
1942	1.85	2.00	1.031	0.95	2.00
1947	2.467	2.646	1.438	1.438	2.563
1948	2.75	2.975	1.922	1.633	3.00
1949	2.75	3.20	1.95	1.70	3.00
1950	2.961	3.317	2.122	1.829	3.219
1951	3.09	3.548	2.279	1.957	3.348
1952	3.155	3.728	2.372	2.021	3.412
1953	3.338	3.865	2.511	2.184	3.579
1954	3.57	4.028	2.754	2.415	3.869
1955	3.649	4.152	2.808	2.489	3.922
1956	3.888	4.304	3.087	2.755	4.187
1957	4.131	4.620	3.348	2.928	4.399
1958	4.374	4.776	3.564	3.186	4.479
1959	4.644	5.175	3.834	3.455	4.955
1960	4.833	5.40	4.023	3.643	5.129
1961	5.076*d*	5.733*e*	4.266*f*	3.888*d*	5.60*g*

WORKDAYS: •a ten hours •b nine hours •c eight hours. All trades have worked a seven-hour day since January, 1938.

HOLIDAYS: All trades have six paid holidays a year, except structural ironworkers who get ten cents an hour in their pay envelopes (on straight time only) in lieu of the paid holidays.

FRINGE BENEFITS: All rates after 1950 include hourly payments by contractors into fringe benefit funds. Current benefits are: •d 4% welfare fund •e 5% welfare fund, 20¢ pension fund, 15¢ vacation fund, 1¢ promotion fund •f 5% welfare fund, 3% pension fund •g 5% welfare fund, 3% pension fund 4% vacation fund.

CONTRACT STATUS: Bricklayers' contract expires May 31, 1962. All other contracts expire June 30, 1963.

Raises Next Year

Costs Roundup—3rd Quarter

Between January and September '61, in the 20 major construction centers regularly covered by ENR, eight new common labor agreements were negotiated along with seven contracts for bricklayers, six for carpenters and four for structural ironworkers. There was a minimum of trouble attendent to the writing of these pacts, in contrast to 1960, when "hard" bargaining had some success in holding wage increases below previous years, but at the cost of a couple of bitter strikes by such pivotal trades as structural ironworkers.

This year, while jurisdictional squabbles were still very much in evidence, there were no wage disputes of consequence involving major construction trades in ENR's 20-cities. What was probably the year's most publicized strike, the New York concrete-mix truck drivers walkout, involved one of the construction industry's peripheral trades.

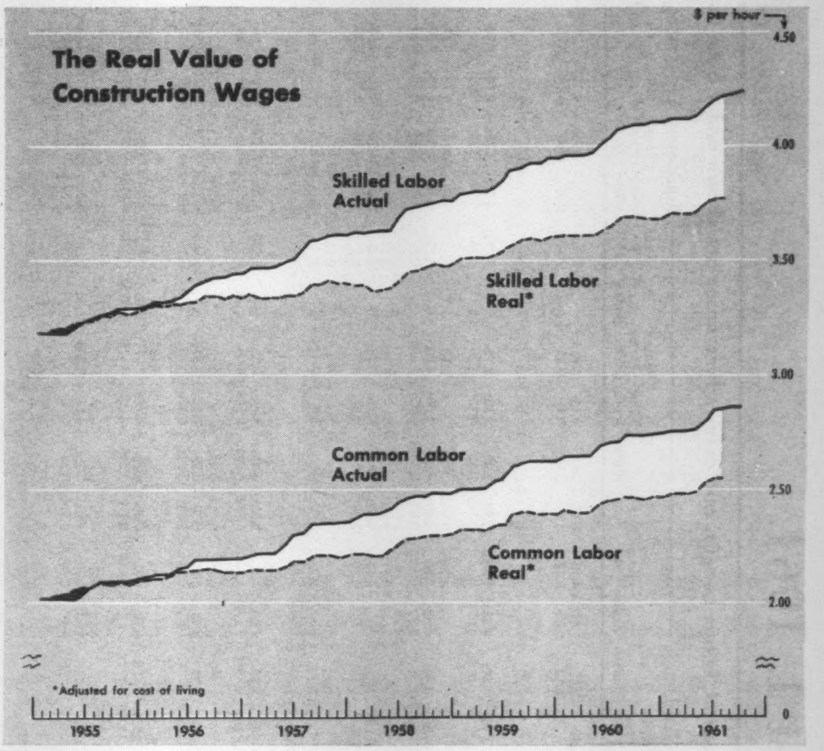
The effects of this "Camp David" spirit at '61 bargaining tables will be felt next year and in '63. The automatic wage hikes written into the contracts negotiated this year are considerably smaller than those provided in some of the long-term '59 and '60 pacts. None of this year's contracts produced anything like the three-year, 70-cent package that building trades in New York City won in '60.

Next year contractors in ENR's 20-cities will negotiate seven common labor agreements, 10 for bricklayers, eight for carpenters and 11 for structural ironworkers. Wage increases under these contracts should be moderate.

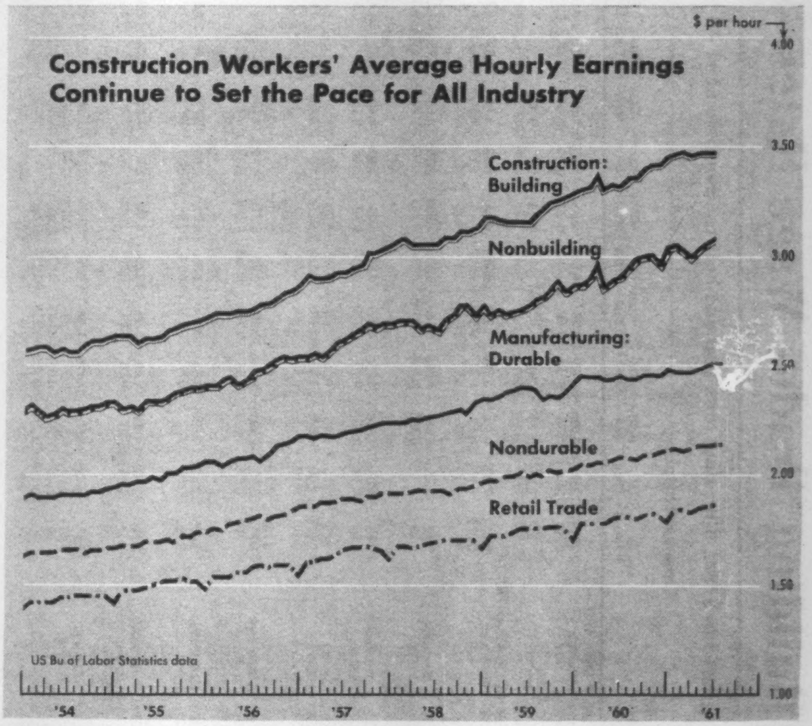
ENR's estimate of the '62 raises under new contracts, added to the automatic increases already scheduled for next year, point to slightly lower average increases than this year. The common labor average should rise 11.2 cents to $2.985 between this December and next. ENR's skilled trades average should mount 13.4 cents to $4.386.

The year's most stunning victory in the fight to keep labor costs in line with reality came in Pittsburgh, where a housing contractor got a union guarantee against jurisdictional strikes and full freedom to use prefabricated items and such labor-saving devices as paint sprayers and power nail drivers. These and other cost-cutting steps ok'd by the union enabled the contractor to reduce the selling prices of his houses by $4,000.

While certainly not the beginning of a trend, the "Pittsburgh plan" does show that something can be done about soaring labor costs.


The Real Value of Construction Wages

*Adjusted for cost of living


Construction Workers' Average Hourly Earnings Continue to Set the Pace for All Industry

US Bu of Labor Statistics data

Building Trades Wage Rates—August 1, 1961

Quoted in $/hr., 8-hr. day; time and one-half for overtime after 40 hr. except as noted. Fringe benefits and deferred increases are shown under base rates.

	Common Labor		Skilled Building Trades																				Equipment Operators					
	Heavy	Bldg	Brick-layer	Car-penter	Ironworker Struc	Ironworker Reinf	Stone Mason	Mason's Helper	Plas-terer	Mosaic & Terr	Tile Layer	Cement Finisher	Lather	Elec-trician Inside	Painter	Glazier	Plumb-er	Steam-fitter	Roofer	Water-proofer	Sheet Metal Wkr	Welder	Truck Dr 1½T	Shovel Oper	Tractor Oper 30 hp	Hoist Engr 1-Dr	Air Comp Oper	Air Tool Oper
NEW ENGLAND																												
Mass., Boston	2.75j	2.90j	4.20c	3.85c	4.26c	4.26j	4.20c	3.05j	4.00c	4.05j	4.05c	4.20c	4.25c	c	3.50j	3.475j	4.10j	4.15c	3.80c	4.15c	4.025c	c	2.85j	4.15j	3.755j	4.15j	3.755c	3.00j
Total fr. ben.	0.10	0.10	0.30	0.10	0.20	0.20	0.30	0.10	0.555	0.30	0.30	0.30	0.35		0.12	0.08	0.32	0.36	0.30	0.30	0.26		0.23	0.35	0.35	0.35	0.35	0.1
Def. inc. '61															0.10													
Def. inc. '62			0.15	0.05			0.15		0.15			0.20	0.15		0.25						0.20							
MIDDLE ATLANTIC																												
Md., Baltimore	2.30j	2.30j	4.10c	3.725c	4.10c	3.90c	4.10c	2.45j	3.85	3.69	2.675c	3.625c	3.85c	3.85j	3.55j	3.525j	3.935j	3.94c	3.00c	3.00c	3.75c	k	2.275j	4.10c	3.75c	4.10c	3.30c	2.325j
Total fr. ben.	0.075	0.075	0.15	0.075	0.203	0.203	0.15	0.075	0.13	0.075	0.10	0.10	0.13	0.1135	0.075	0.075	0.14	0.175	0.12	0.12	0.20	0.178	1.25	0.20	0.20	0.20	0.20	0.075
Def. inc. '61			0.05				0.05																					
Def. inc. '62										0.10	0.10						0.13	0.15			0.15			0.10	0.10	0.10	0.10	
N. J., Newark	3.30	3.75c	4.65c	4.65c	5.15c	5.15c	4.65c	3.75c	4.65c	4.75c	4.355c	4.65c	4.65c	4.65c	3.95c	4.40c	4.50c	4.50c	4.50c	4.50c	4.60c	b	3.15c	5.35c	4.28c	4.75c	4.50c	3.30
Total fr. ben.	0.30		0.336	0.336	0.5665	0.5665	0.336		0.336	0.4275	0.4355	0.336	0.36	0.8835	0.36	0.30	0.54	0.54	0.35	0.35	0.368		0.19	0.30	0.30	0.30	0.30	0.30
Def. inc. '61																0.20												
Def. inc. '62					0.2775	0.2775				0.3135	0.352						0.212	0.212			0.162		0.15					
N. J., Trenton	2.65	3.05c	4.45c	4.25c	4.85c	4.85c	4.45c	3.05c	4.45c		4.45c	4.45c	4.05c	4.60c	3.625c		4.65c	4.65c	4.35c	4.35c	4.50c	b	3.15c	5.35c	4.28c	4.75c	4.50c	3.30
Total fr. ben.	0.30	0.10	0.15	0.10	0.230	0.230	0.15	0.10	0.15		0.15	0.15		0.296	0.15		0.30	0.30	0.25	0.25	0.25		0.19	0.30	0.30	0.30	0.30	0.30
Def. inc. '61																												
Def. inc. '62		0.15	0.20	0.20	0.15	0.15	0.20	0.15	0.20		0.20	0.20	0.30		0.15								0.15					
N. Y., Albany	2.775	2.90	4.15c	3.65c	4.10c	4.10c	4.15c	c	4.15c			4.15c			3.30c		3.95c	3.95c				b						2.925
Total fr. ben.	0.10	0.10		0.075	0.20	0.20											0.22											0.10
Def. inc. '61																												
Def. inc. '62	0.15	0.15	0.15	0.20			0.20		0.15			0.15					0.15											
N. Y., New York	3.65j	3.65j	5.20ac	4.75a	5.05c	5.05c	5.31ac	4.00aj	4.70co	4.75ac	d	4.85aj	4.75ac	4.40jo	3.77ac	4.35ac	4.45ac	4.80ac	4.40ac	4.40ac	4.75ac	b	3.525	5.25c	0.375c	5.00c	4.50c	4.10c
Total fr. ben.	0.292	0.292	0.62	0.38	0.706	0.706	0.528	0.32	0.95	0.4275		0.372	0.48	1.283	0.4524	0.7785	1.39	0.732	0.802	0.802	0.68		0.35	0.42	0.35	0.40	0.36	0.492
Def. inc. '61																	0.114											
Def. inc. '62	0.324	0.324		0.324	0.280	0.280		0.216		0.327		0.324	0.324			0.112	0.171	0.23	0.324	0.324	0.432			0.324	0.324	0.324	0.324	0.324
Pa., Harrisburg	2.425c	2.425	4.00c	3.43c	4.60c	4.60c	4.00c	2.55c	3.775c	3.50	2.625	3.525c	3.775c	3.75	3.05	3.00c	3.75	3.75	2.80c	2.80c	3.575c	c	2.385c	4.225c	3.63c	3.935c	3.56c	2.55
Total. fr. ben	0.09	0.09		0.09	0.24	0.24	0.09	0.09	0.09			0.09	0.09	0.0375		0.06	0.13	0.13	0.035	0.035	0.10		0.10	0.20	0.10	0.20	0.20	0.09
Def. inc. '61																												
Def. inc. '62														0.125			0.15	0.15			0.125							
Pa., Philadelphia	2.70j	2.70j	4.40a	4.00c	4.60c	4.60c	4.40c	c	4.30c	4.18c	3.975c	3.875c	4.175c	4.525c	3.475c	3.80c	4.25c	4.35c	4.15c	4.15c	4.385c	3.66c	2.64j	4.50j	4.03j	4.03j	3.63j	2.70j
Total fr. ben.	0.10	0.15	0.17	0.20	0.23	0.23			0.20		0.15	0.15	0.275	0.1769	0.225		0.415	0.315	0.225	0.225	0.125	0.275	0.180	0.275	0.275	0.275	0.275	0.15
Def. inc. '61														0.15														
Def. inc. '62													0.10			0.15	0.20	0.20	0.20	0.20	0.15	0.175		0.175	0.175	0.175	0.175	
Pa., Pittsburgh	2.55	2.85c	4.60c	4.225c	4.30	4.20	4.60c	2.20	4.325c	4.25c	4.15c	4.25	4.325c	4.60j	3.80	3.80c	4.30c	4.15c	3.95c	4.35c	4.20c	2.55	2.75	4.60c	3.82c	4.175c	4.175c	2.825c
Total fr. ben.	0.20	0.20	0.20	0.20	0.20	0.290	0.20	0.30	0.20	0.30	0.10	0.30	0.20	0.5060	0.125	0.10	0.465	0.515	0.20	0.20	0.41	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Def. inc. '61		0.05	0.075	0.075	0.075	0.075	0.05			0.075														0.05		0.05	0.05	0.05
Def. inc. '62		0.175	0.225	0.225	0.225	0.225	0.225			0.225											0.20			0.20		0.20	0.20	0.20
SOUTH																												
Ala., Birmingham	2.05d	1.95d	4.05cd	3.23d	3.77c	3.77c	4.05cd	2.00cd	3.37cd	3.45	3.45	3.23cd	3.15cd	3.925c	3.10c	3.30c	3.80c	3.80c	2.85c	2.85c	3.65c	b	2.00cd	3.30cd	3.30cd	3.30cd	3.05cd	2.15cd
Total fr. ben.					0.13	0.13											0.125	0.125			0.075							
Def. inc. '61																	0.15	0.15			0.05							
Def. inc. '62					0.06	0.06				0.05	0.05			0.10	0.10				0.10	0.10	0.10							
Fla., Jacksonville	1.10	1.35	3.70c	3.25c	3.70c	3.60c	3.70c	1.35	3.50c	3.45c	3.45	2.90c	3.50	3.80c	3.00	3.00	3.80	3.80	3.25		3.65c	2.10	1.50	3.40	2.65	2.20	2.40	1.50
Total fr. ben.														0.076			0.15	0.15										
Def. inc. '61					0.075	0.075										0.10												
Def. inc. '62			0.10				0.10					0.10			0.05	0.05					0.10			0.10		0.10	0.10	
Ga., Atlanta	2.00	2.00	4.00c	3.45d	3.70cd	3.70cd	4.00cd	2.00	3.50c	3.75c	3.75c	3.30	2.65	4.00	3.40d	3.15	4.00c	4.00c	3.50c	3.50c	3.80	3.80	2.77j	d	d	3.88c	d	2.22
Total fr. ben.					0.075	0.075								0.041			0.25	0.25										
Def. inc. '61	0.10	0.10												0.15		0.15												
Def. inc. '62	0.15	0.15						0.15	0.125			0.15	0.10						0.125	0.125	0.10	0.10	0.10			0.12		0.15
Ky., Frankfort	2.70	2.45	4.06	3.725	4.00	4.00	4.06	3.60	3.75	3.60	3.60	3.70	3.75	3.975	3.375	3.19	3.925	3.925	3.00	b	3.825	3.825	3.13	3.75	3.25	3.25	2.90	2.90
Total fr. ben.			0.115	0.115	0.10	0.10	0.115							0.075			0.10	0.10			0.075	0.075						
Def. inc. '61										0.15	0.15						0.125	0.125			0.10							
Def. inc. '62					0.05	0.05				0.15	0.15								0.15		0.10							
Ky., Louisville	2.70	2.70	4.06	3.725	4.00	4.00	4.06	2.925	3.75	3.75	3.60	3.70	3.75	3.975	3.375	3.19	3.925	3.925	3.00	3.00	3.825		2.975	2.90		3.25		
Total fr. ben.	0.10	0.10	0.115		0.10	0.10	0.115		0.05					0.075			0.10	0.10			0.075							
Def. inc. '61														0.05			0.125	0.125			0.075							
Def. inc. '62				0.075	0.05	0.05																						
La., New Orleans	2.05i	1.975i	3.775c	3.35c	3.65c	3.345c	3.775c	2.075i	3.345c	3.30i	3.30i	3.175i	3.435c	4.05c	3.425c	3.15c	4.00c	4.00c	3.35c	3.775c	3.51c	3.51c	3.475c	3.475c	3.475c	3.475c	2.75c	2.075i
Total fr. ben.			0.075		0.10	0.10	0.075		0.08				0.08	0.09		0.155			0.075		0.075	0.075	0.075	0.075	0.075	0.075	0.075	
Def. inc. '61		0.03	0.05	0.05	0.05	0.05	0.05	0.03	0.075			0.10	0.065			0.10				0.05			0.05	0.05	0.05	0.05	0.025	0.03
Def. inc. '62										0.10	0.10			0.10	0.125													
S. C., Charleston	1.20	1.20	3.60	2.90	3.20		3.60		2.65			2.15	2.50	3.25	1.75	2.10	3.50	3.70	1.75		3.05		1.00	2.90	2.00	2.00	2.15	1.25
Total fr. ben.																												
Def. inc. '61																												
Def. inc. '62																												

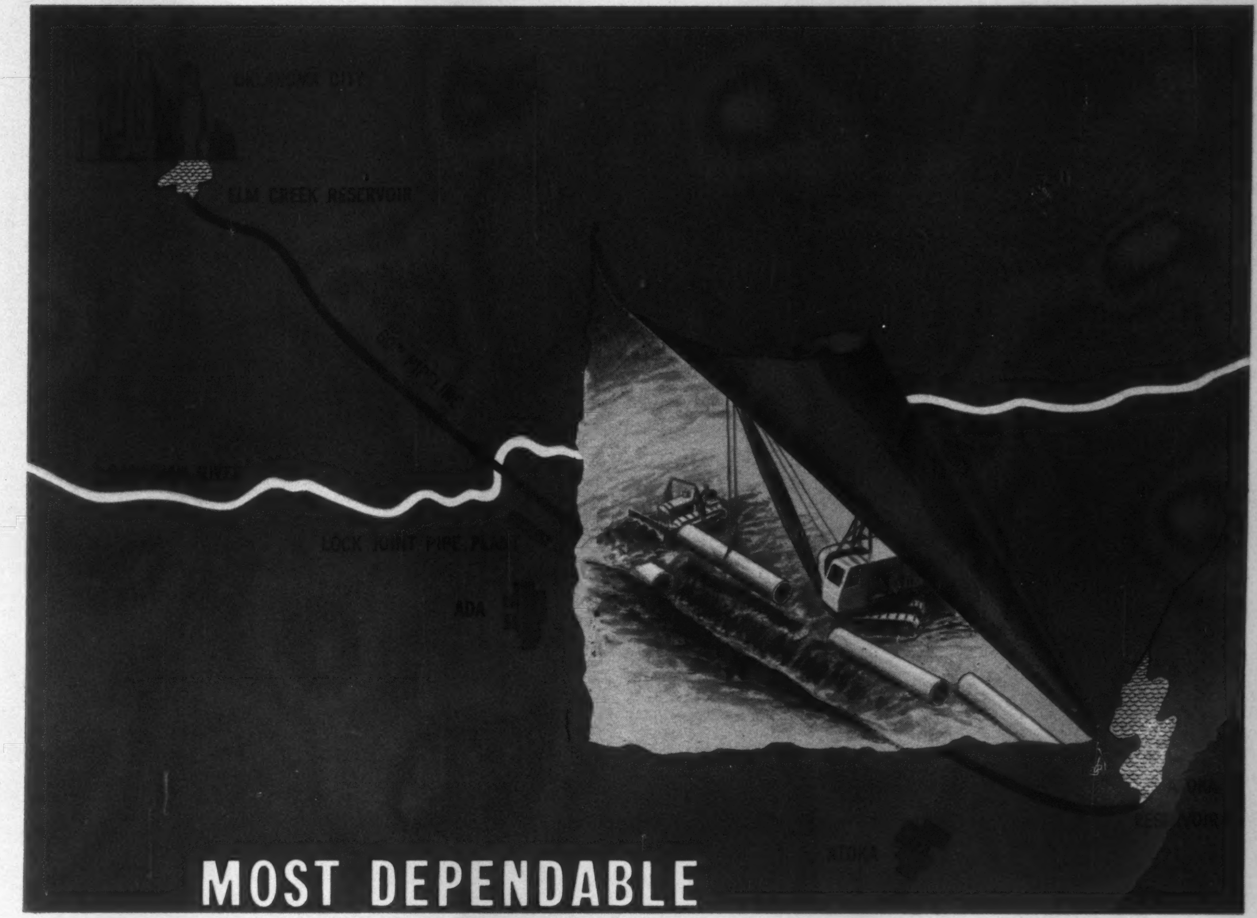
Building Trades Wage Rates—*continued*

	Common Labor		Skilled Building Trades																				Equipment Operators					
	Heavy	Bldg	Bricklayer	Carpenter	Ironworker Struc	Ironworker Reinf	Stone Mason	Mason's Helper	Plasterer	Mosaic & Terr	Tile Layer	Cement Finisher	Lather	Electrician Inside	Painter	Glazier	Plumber	Steamfitter	Roofer	Waterproofer	Sheet Metal Wkr	Welder	Truck Dr 1½T	Power Shovel Oper	Tractor Oper 70-100 hp	Hoist Engr 1-Dr	Air Comp Oper	Air Tool Oper
Tenn., Nashville	m	m	**3.95c**	**3.45c**	**3.60c**	**3.50c**						**3.00**		**3.525ij**	**3.15ij**	**3.05**	**3.80c**	**3.80c**	**2.90ij**	**3.15ij**	**3.35c**		**2.20ij**		**3.20c**	**2.75c**		
Total fr. ben.														0.1035			0.11	0.11										
Def. inc. '61															0.05				0.07	0.07	0.05							
Def. inc. '62				0.20		0.25						0.15					0.10	0.10	0.13	0.13	0.15		0.10		0.10	0.10		
Va., Norfolk	**1.75**	**1.65**	**3.75c**	**2.98**	**3.475c**	**3.225c**	**3.75c**	**1.75**	**3.55c**	**3.25**	**3.25**	**2.775**	**3.60c**	**3.65**	**3.05**	**2.85**	**3.55c**	**3.55c**	**1.85**	**4.20**	**3.35c**	b	**1.65**	**3.375**	**2.97**	**2.35**	**2.35**	**1.75**
Total fr. ben.																												
Def. inc. '61																												
Def. inc. '62																												
MIDWEST																												
Ill., Chicago	**3.225g**	**3.225g**	**4.40c**	**4.08c**	**4.55c**	c	**4.40c**	**3.225g**	**4.175c**	**4.25c**	**4.20c**	**4.08c**	**4.10c**	**4.50c**	**3.825c**	**4.20c**	**4.20c**	**4.25c**	**4.32j**	**4.08c**	**4.25j**	**4.25c**	**2.68j**	**4.40c**	**3.80c**	**4.05c**	**3.70c**	b
Total fr. ben.	0.075	0.075	0.10	0.20	0.16		0.10	0.075	0.27		0.75	0.20	0.30		0.30	0.20	0.16	0.25	0.28	0.20	0.25	0.25	0.2125	0.05	0.05	0.05	0.05	
Def. inc. '61																												
Def. inc. '62									0.175		0.15												0.08				0.15	
Ill., Springfield	**2.90c**	**3.00c**	**4.00**	**3.675c**	**3.95c**	**3.95c**		**3.10**	**4.20**	**3.75d**	**3.55**	**3.50c**	**3.80**	**3.85**	**3.45**	**3.50**	**3.85**	**3.85**	**3.66**		**3.75**		**3.025**			**3.60c**	**2.95**	**3.00d**
Total fr. ben.			0.10	0.075	0.10	0.10				0.10				0.05			0.12	0.12			0.075							
Def. inc. '61						0.025																						
Def. inc. '62																												
Mich., Detroit	**3.00c**	**3.00c**	**4.09c**	**3.75c**	**4.10c**	**3.62c**	**4.09c**	**3.00c**	**3.87c**	**3.82c**	**3.82c**	**3.47c**	**3.75c**	**4.11c**	**3.625c**	**3.52c**	**3.90c**	**3.90c**	**4.01c**	**3.47c**	**4.00c**	**4.10c**	**3.11c**	**3.74c**	**3.74c**	**3.74c**	**3.74c**	**3.13c**
Total fr. ben.	0.34	0.34	0.1254	0.475	0.325	0.28	0.1254	0.34	0.40136	0.35	0.31	0.3641	0.47	0.5288	0.325	0.107	0.51	0.51	0.225	0.3641	0.5200	0.325	0.02	0.3996	0.3996	0.3996	0.3996	0.3139
Def. inc. '61	0.103	0.103	0.116	0.132	0.15		0.116	0.103	0.125	0.12	0.12		0.12	0.136	0.125	0.05			0.02		0.113	0.15	0.084	0.114	0.114	0.114	0.114	0.103
Def. inc. '62														0.018									0.09					
Ohio, Cincinnati	**2.90c**	**3.025c**	**4.125c**	**3.95c**	**4.025c**	**4.00c**	**4.225c**	**3.225c**	**3.925c**	**3.80c**	**3.90c**	**3.775c**	**3.925c**	**4.09c**	**3.50c**	**3.925c**	**4.115c**	**4.10c**	**3.91c**	b	**3.96c**	b	**2.75**	**3.90**	**3.675**	**3.675**	**3.90**	**3.90**
Total fr. ben.			0.125		0.105	0.10			0.01	0.10		0.10	0.05	0.0511			0.32	0.215			0.10		0.1125	0.10	0.10	0.10	0.10	0.10
Def. inc. '61									0.075			0.05	0.025			0.125		0.05			0.04							
Def. inc. '62	0.125	0.125	0.125	0.175	0.225	0.125	0.125	0.125	0.10	0.125	0.125	0.125	0.10				0.15	0.10	0.14		0.10			0.125	0.125	0.125	0.125	0.125
Ohio, Cleveland	**3.435i**	**3.52i**	**4.085c**	**4.11c**	**4.16c**	**4.16c**	**4.085c**	**3.52c**	**4.26c**	**3.875c**	**4.085c**	**4.26c**	**4.17c**	**4.29c**	**3.875c**	**3.86c**	**4.06c**	**4.06c**	**4.26c**	**4.26c**	**4.085c**	c	**3.07c**	**4.16c**	**3.91c**	**4.035c**	**3.785c**	**3.885c**
Total fr. ben.			0.25	0.15	0.10	0.10	0.25			0.25			0.09		0.21	0.40	0.20	0.20			0.175		0.15	0.10	0.10	0.10	0.10	
Def. inc. '61															0.01													
Def. inc. '62	0.15	0.15	0.12	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15		0.15	0.15	0.15	0.15	0.15	0.15	0.15		0.15	0.15	0.15	0.15	0.15	0.15
Ohio, Columbus	**2.80**	**2.80**	**4.06c**	**3.70**	**4.00c**	**4.00c**	**4.06**		**3.75c**	**3.615**	**3.615**	**3.50**	**3.75c**	**3.96c**	**3.30**	**3.17**	**3.95c**	**3.95c**	**3.725**	**3.90**	**3.825**			**3.90c**	**3.90c**	**3.90c**	**3.90c**	**3.525**
Total fr. ben.			0.11	0.01	0.10	0.10	0.11							0.1075	0.125		0.075	0.075	0.1186	0.1186	0.10			0.10	0.10	0.10	0.10	0.10
Def. inc. '61			0.08				0.08		0.05	0.05	0.05	0.05	0.05			0.05	0.025	0.025	0.05	0.05	0.05							
Def. inc. '62									0.10	0.10	0.10		0.10											0.125	0.125	0.125	0.125	
Ohio, Dayton	**2.86**	**2.86**	**4.24c**	**3.95c**	**3.99c**				**3.92c**	**3.97c**	**3.97c**	**3.70**	**3.92c**	**4.17c**	**3.55c**	**3.60**	**4.00c**	**4.00c**	**3.71**	**3.71**	**3.875c**				**3.35c**	**3.70c**	**3.35c**	
Total fr. ben.					0.10									0.0417			0.10	0.10	0.12	0.12	0.075				0.10	0.10	0.10	
Def. inc. '61			0.06	0.05	0.06				0.08	0.06	0.06	0.05	0.08	0.08	0.10				0.15		0.05				0.05	0.05	0.340	
Def. inc. '62		0.10	0.12							0.12	0.12					0.05	0.10	0.10			0.15							
Ohio, Toledo	**3.19i**	**3.19i**	**4.18c**	**4.07c**	**4.07c**	**4.04c**	**4.10c**	**3.32c**	**3.97c**	**4.18c**	**3.95c**	**4.07c**	**3.97c**	**4.15i**	**3.79c**	**3.60c**	**4.10c**	**4.10c**	**3.91c**	**3.91c**	**3.91c**	c	**2.92i**	**4.07i**	**3.79i**	**3.93i**	**3.655i**	**3.345i**
Total fr. ben.	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.08	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10		0.10	0.10	0.10	0.10	0.10
Def. inc. '61																												
Def. inc. '62																												
Wis., Milwaukee	**3.10**	**2.92**	**3.96**	**3.71**	**3.81**	**3.81**	**3.96**	**3.04**	**3.69**	**3.87**	**3.71**	**3.54**	**3.79**	**3.87**	**3.46**	**3.60**	**3.82**	**3.82**	**3.52**	**3.52**	**3.76**	**3.81**	**2.80**	**3.835**	**3.67**	**3.505**	**3.23**	**3.15**
Total fr. ben.	0.30	0.30	0.30	0.30	0.20	0.20	0.30	0.30	0.30	0.319	0.313	0.20	0.20	0.3003	0.30	0.27	0.30	0.30	0.30	0.30	0.30	0.20	0.2125	0.20	0.20	0.20	0.20	0.30
Def. inc. '61																												
Def. inc. '62																												
WEST OF MISSISSIPPI																												
Col., Denver	**2.42j**	**2.47j**	**4.15c**	**3.80c**	**3.81c**	**3.81c**	**4.15c**	**2.80**	**3.975c**	**4.05c**	**4.05c**	**3.80**	**3.975c**	**4.20**	**3.45**	**3.32**	**4.05**	**4.05**	**3.55**	**3.55**	**4.05c**	b	**3.05**	**3.40**	**3.25**	**3.25**	**3.25**	**2.75**
Total fr. ben.					0.10	0.10			0.05								0.12	0.12	0.10	0.10								
Def. inc. '61					0.10	0.10									0.05		0.05	0.05										
Def. inc. '62	0.15		0.10	0.10			0.10	0.10				0.10			0.15		0.15	0.15						0.10	0.10	0.10	0.10	
Iowa, Des Moines	m	**2.875c**	**4.375c**	**3.60c**	**3.725c**	**3.725c**	**4.375c**	**2.875c**	**3.825c**	**3.70c**	**3.70c**	**3.75c**	**3.825c**	**4.125c**	**3.47c**	**3.24c**	**4.225c**	**4.225c**	**3.20c**	**4.375c**	**3.85c**	c	**2.91c**	**3.825c**	**3.60c**	**3.60c**	**3.175c**	**2.975c**
Total fr. ben.		0.075		0.125	0.125	0.125		0.075						0.125			0.14	0.14			0.15		0.075					0.075
Def. inc. '61		0.25																										
Def. inc. '62		0.10																										
Minn., Minneapolis	**2.98**	**3.00**	**4.025c**	**3.68**	**3.77c**	**3.77c**	**3.70c**	**3.10**	**3.80**	**3.70**	**3.54**	**3.70**	**3.65**	**3.85**	**3.39**	**3.50**	**3.77**	**3.77**	**3.63**	**3.63**	**0.381**	b	**2.98**	**3.82**	**3.82**	**3.75**	**3.25**	**3.15**
Total fr. ben.			0.15	0.15	0.15		0.15		0.33	0.15	0.12	0.15	0.18	0.5505	0.27	0.14	0.38	0.38	0.15	0.15	0.25							
Def. inc. '61	0.13	0.10	0.15	0.18	0.15	0.15	0.15	0.10	0.20	0.15	0.15	0.15	0.15	0.15		0.17	0.15	0.15	0.18	0.18	0.25		0.13	0.15	0.15	0.15	0.13	0.15
Def. inc. '62	0.12	0.10	0.10	0.10	0.13	0.13	0.10	0.10	0.10	0.10	0.18	0.10	0.10		0.09	0.12	0.15	0.15	0.15	0.15	0.02		0.12			0.10	0.12	0.10
Minn., St. Paul	**2.98**	**3.00**	**4.025c**	**3.68**	**3.77c**	**3.77c**	**3.90c**	**3.10**	**2.75**	**3.70**	**3.54**	**3.70**	**3.60**	**3.85**	**3.30**	**3.50**	**3.77**	**3.77**	**3.63**	**3.63**	**3.62**	b	**2.98**	**3.82**	**3.82**	**3.75**	**3.25**	**3.15**
Total fr. ben.			0.15	0.15	0.15	0.15	0.15		0.38	0.22	0.17	0.15	0.48	0.5105	0.31	0.14	0.38	0.38	0.15	0.15	0.50							
Def. inc. '61	0.13	0.15	0.15	0.18	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15			0.17	0.15	0.15	0.15	0.15			0.13	0.15	0.15	0.15	0.13	0.15
Def. inc. '62	0.12	0.10	0.10	0.10	0.13	0.13	0.10	0.10	0.10	0.10	0.18	0.10	0.10		0.12	0.12	0.15	0.15	0.15	0.15			0.12	0.15	0.15	0.10	0.12	0.10
Mont., Billings	**2.75**	**2.75**	**4.00c**	**3.35**	**3.875c**	**3.875c**	**4.00c**	**3.02**	**3.45**	**4.00c**	**3.60c**	**3.02**	**3.375c**	**3.75**	**3.10d**	**3.00**	**3.80**	**3.75**	**3.12**	**3.12**	**3.40**	**3.875**	**2.73**	**3.33**	**2.83**	**3.11**	**2.88**	**3.05**
Total fr. ben.														0.25			c	0.40c			0.10d	c						
Def. inc. '61																												
Def. inc. '62			0.10	0.15			0.10							0.15			0.075											
Neb., Omaha	**2.55c**	**2.625c**	**4.10c**	**3.70c**	**3.65c**	**3.65c**	**4.10c**	**2.90c**	**3.875c**	**3.55c**	**3.55c**	**3.70c**	**3.875c**	**4.00c**	**3.30c**	**3.30c**	**4.01c**	**4.01c**	**2.90c**	**2.90c**	**3.55c**	**3.45c**		**3.65c**	**3.30c**	**3.30c**	**3.10c**	**2.55c**
Total fr. ben.									0.10					0.10			0.185	0.185			0.260							
Def. inc. '61																												
Def. inc. '62															0.15													

Building Trades Wage Rates—*continued*

	Common Labor		Skilled Trades																				Equipment Operators					
	Heavy	Bldg	Bricklayer	Carpenter	Ironworker Struc	Ironworker Reinf	Stone Mason	Mason's Helper	Plasterer	Moasic P Terr	Tile Layer	Cement Finisher	Lather	Electrician Inside	Painter	Glazier	Plumber	Steamfitter	Roofer	Waterproofer	Sheet Metal Wkr	Welder	Truck Dr 1½ T	Power Shovel Oper	Tractor Oper 70-100 hp	Hoist Engr 1-Dr	Air Comp Oper	Air Tool Oper
N. D., Bismark	1.90	1.90	3.60	2.72	3.85	3.85	3.60	1.95	3.25	3.60	3.60	3.25	2.75	3.25	2.50	2.50	3.20	3.20	2.70	2.70	2.60	b	1.75	3.49	2.32	3.38	3.05	2.50
Total fr. ben.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Okla., Okla. City	2.42	2.42	4.00c	3.375	3.65c	3.65c	4.00c	2.57	3.75c	3.65	3.65	3.50	3.75c	3.90	3.25	3.10	3.95	3.95	3.25	3.25	3.60	b	2.60	3.25	2.775	3.25	3.25	2.57
Total fr. ben.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.05	....	....	....	....	....	....	....
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	0.10	0.125	....	....	....	....	....	....	....	....	....	0.10	....	....	....	....	....
Def. inc. '62	....	....	....	....	0.125	0.125	....	0.084	....	....	....	0.10	....	....	....	....	....	....	....	....	0.20	....	0.10	....	....	....	....	0.08
S. D., Pierre	1.80	1.80	3.85f	3.15	3.55	3.55f	4.30f	....	4.30f	4.30f	4.25f	2.75f	4.25f	3.85f	3.00	3.00	3.65	4.00	3.26	3.26	3.26	3.30f	3.15f	3.65f	3.55f	3.55f	2.55f	2.55f
Total fr. ben.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '61	0.15	0.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	0.15	0.15	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.15	0.15	0.15	0.15	0.15	0.15
Tex., Austin	1.65	1.55	4.00c	3.35c	3.615c	3.365c	4.00c	1.875	3.75c	3.50c	3.50c	3.40	3.75c	3.75c	2.935	2.55	3.70c	3.70	2.40	2.40	3.75c	b	1.50	3.675c	3.675c	3.225c	3.225c	1.65
Total fr. ben.	....	....	....	....	0.095	0.095	....	....	....	....	....	....	....	....	....	....	0.01	0.01	....	....	....	....	....	....	....	....	....	....
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.075	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.065	....	0.15	0.15	....	....	....	....	....	....	....	....	....	....
Tex., Dallas	1.95	1.95	4.15	3.55j	3.675c	3.425c	4.15	2.10	3.875c	3.438c	3.438c	3.50i	3.875c	3.625j	3.45	3.10	....	....	2.95	2.95	3.625i	3.675c	2.625	3.425c	2.625	3.425c	2.10	2.10
Total fr. ben.	....	....	....	....	0.08	0.08	....	....	0.10	....	....	....	....	0.075	0.075	....	....	....	....	....	0.10	0.08	....	....	....	....	....	....
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	0.05	0.063	....	....	0.10	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	0.05	....	....	....	....	....	0.063	0.063	0.05	....	....	....	0.15	....	....	0.10	0.10	....	....	....	....	....	0.05	....	....
Tex., Ft. Worth	1.90	1.90	4.20c	3.425c	3.625c	3.375c	4.20c	2.00	3.875c	3.50c	3.50c	3.50	3.875c	3.625j	3.3125	3.10	3.75d	3.75d	2.95	2.95	3.675	3.675j	2.075j	3.675c	3.275c	3.275c	3.275c	2.05
Total fr. ben.	....	....	....	....	0.075	0.075	....	....	0.125	....	....	....	0.125	0.075	....	....	....	....	....	....	0.10	0.10	....	....	....	....	....	....
Def. inc. '61	....	....	....	....	0.05	0.05	....	....	....	....	....	....	....	....	....	0.10	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	0.05	0.05	0.05	0.05	0.075	0.075	0.05	0.05	0.125	....	....	....	0.125	....	0.0625	0.15	....	....	0.10	0.10	0.05	0.05	0.05	0.075	0.125	0.125	0.125	0.05
Tex., Houston	2.10	2.10	4.125	3.665	3.775	3.525	....	....	3.913	3.80	3.80	3.675	3.9062	4.05	3.485	3.335	3.75	4.075	3.225	3.225	3.86	b	2.575	3.90	3.90	3.40	3.40	2.10
Total fr. ben.	....	....	....	0.01	0.085	0.085	....	....	0.135	....	....	....	0.135	0.195	0.09	....	0.20	0.215	....	....	0.105	....	....	....	....	....	....	....
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
FAR WEST																												
Calif., Los Angeles	3.26	3.26	4.35c	4.00c	4.275c	4.275c	4.35c	3.51	4.25c	4.10	4.40	4.04	4.25	4.65cd	3.91a	3.925	4.58c	4..58c	3.95	4.25	4.20c	....	3.575	4.41	4.31	4.01	3.53	3.47
Total fr. ben.	0.10	0.10	0.25	0.2025	0.255	0.255	0.25	0.10	0.555	....	0.22	0.1025	0.555	0.0465	0.195	0.075	0.687	0.687	0.10	0.10	0.41	....	0.10	0.25	0.25	0.25	0.25	0.10
Def. inc. '61	....	....	....	....	0.325	0.325	....	....	....	....	....	....	....	....	....	....	....	....	0.10	0.10	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	0.10	....	....	....	....	....	....	....	....	....	....	0.10	0.09	0.2875	0.2875	0.35	0.35	0.3999	....	....	....	....	....	....	....
Calif. ,San Diego	3.28	3.28	4.50c	4.05c	4.275c	4.025c	4.50c	3.56	4.425c	4.10d	4.10d	4.135	4.425c	4.60cd	3.87a	3.925	4.58c	4.58c	4.35d	4.35d	4.20	....	3.575	4.41	4.31	4.01	3.53	3.49
Total fr. ben.	0.075	0.075	0.175	0.20	0.25	0.25	0.175	0.175	0.155	0.03	0.03	0.10	0.155	0.146	0.29	0.075	0.71	0.71	0.10	0.10	0.21c	b	0.10	0.25	0.25	0.25	0.25	0.075
Def. inc. '61	....	....	....	....	0.325	0.325	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.27	0.09	0.2875	0.2875	....	....	....	....	....	....	....	....	....	....
Calif., San Francisco	3.255g	3.255g	4.40cd	3.95c	4.275c	4.275cd	4.40cd	cd	4.29d	4.40	4.25c	3.60c	4.19c	4.38c	3.92a	3.89	4.57c	4.57c	4.20g	4.20g	4.135c	4.275	3.38e	4.67	4.23	4.00	3.67	3.655
Total fr. ben.	0.10	0.10	0.425	0.36	0.255	0.255	0.425	....	0.65	0.425	0.31	0.14	0.73	0.37	0.345	0.231	0.760	0.760	0.450	0.450	0.37	0.255	0.21	0.35	0.35	0.35	0.35	0.10
Def. inc. '61	....	....	....	....	0.325	0.325	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	....	....	....	....	....	0.25	....	0.25	....	0.30	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Idaho, Boise	2.70j	2.70j	4.00ij	3.40j	3.85c	3.85c	4.00ij	3.00j	3.15j	4.00ij	4.00ij	3.52ij	....	3.85j	....	....	3.85c	3.85c	....	....	3.85c	3.85c	3.00e	3.45l	3.55l	3.05l	3.05l	2.90j
Total fr. ben.	0.075	0.075	....	0.075	0.075	0.075	....	0.075	....	....	....	....	....	0.0385	....	....	0.12	0.12	....	....	0.075	0.075	0.075	0.075	0.075	0.075	0.075	0.075
Def. inc. '61	0.15	0.15	0.15	0.15	0.30	0.30	0.15	0.05	....	0.15	0.15	0.17	....	0.10	....	....	0.15	0.15	....	....	0.30	0.30	0.15	0.15	0.15	0.15	0.15	0.15
Def. inc. '62	0.15	0.15	....	....	0.05	0.05	....	0.15	....	....	....	0.15	....	....	....	....	0.15	0.15	....	....	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Oregon, Portland	2.90j	2.95c	4.17c	3.63c	3.92c	3.72c	4.17c	3.35c	3.93c	3.91	3.826	3.64ij	3.95c	4.15c	3.56ij	3.625cd	4.02c	4.02c	3.71c	3.71c	3.80ij	....	3.81ij	3.81dij	3.85ij	3.51ij	3.15c	3.15c
Total fr. ben.	0.20	0.20	0.28	0.10	0.10	0.10	0.28	0.20	0.12	0.13	0.23	0.10	0.10	0.1415	0.12	0.10	0.24	0.24	0.10	0.10	0.35	....	0.20	0.20	0.20	0.20	0.20	0.20
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	0.20	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0.10	....	....	....	....	....
Utah, Ogden	2.55	2.55	3.84	3.40	3.675	3.675	3.84	2.95	3.725	3.375	2.75	2.75	3.725	3.90	3.10	3.08	3.80	2.675	3.20	3.20	3.36	2.25	2.85	3.42	3.20	2.98	2.92	3.04
Total fr. ben.	....	....	....	0.10	0.075	0.075	....	....	0.10	....	....	....	0.10	0.01	....	....	0.115	....	0.075	0.075	0.10	....	0.075	0.10	0.10	0.10	0.10	0.10
Def. inc. '61	0.125	0.125	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	0.125	0.125	....	0.20	....	....	....	....	....	....	....	....	....	....	....	....	....	0.125	....	....	....	....	....	....	....	....	....	....
Utah, Salt Lake City	2.55	2.55	3.84c	3.40	3.775c	3.775c	3.84c	3.05c	3.825	....	3.50	3.375	3.82d	3.90	3.20	3.24	3.85c	3.85c	3.275	3.59	3.52c	3.10	2.725	3.54	3.34	3.12	3.06	2.675
Total fr. ben.	....	....	0.02	0.10	0.075	0.075	0.02	0.02	0.10	....	....	0.10	0.10	0.039	0.10	....	0.17	0.17	0.10	0.10	0.17	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Def. inc. '61	....	....	....	....	0.10	0.10	....	....	....	....	....	....	....	....	....	....	0.05	0.05	....	....	0.11	....	....	....	....	....	....	....
Def. inc. '62	0.10	0.10	....	0.20	....	....	....	0.10	....	....	....	0.125	....	....	0.10	....	0.15	0.15	0.075	0.07	....	0.24	0.175	0.25	0.25	0.23	0.22	0.125
Wash., Seattle	3.00c	3.00c	4.30c	3.53c	3.92c	3.92c	4.30c	3.45c	3.87c	4.02c	4.02c	3.85c	3.87c	4.025c	3.615c	3.59ce	4.14c	4.14c	3.78	4.03	3.96c	4.40c	3.50c	4.28c	3.91c	3.94c	3.64c	3.35c
Total fr. ben.	0.25	0.25	0.30	0.20	0.10	0.10	....	....	0.32	0.25	0.25	....	0.3135	0.26	0.12	0.10	0.29	0.29	....	....	0.46	0.15	0.30	0.30	0.30	0.30	0.30	0.10
Def. inc. '61	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Def. inc. '62	....	....	....	....	....	....	....	....	0.14	0.075	0.075	0.17	0.14	0.05	....	....	....	....	....	....	....	....	0.20	0.20	0.20	0.10	0.20	....

•a seven hour day •b work done by other crafts •c double time for overtime •d negotiating new contract as this ENR survey went to press •e on strike as this survey went to press •f six hour day •g double time after first two hours •h double time after first four hours •i double time on Saturdays and Sundays •j double time on Sundays and holidays •k rate of highest paid craft on job •l double time on legal holidays only •m largely ununionized, rate by negotiation •n trade working without contract



MOST DEPENDABLE
MOST ECONOMICAL
FOR THE
LONG
HAUL!

When a city must go 100 miles for a sufficient supply of potable water, authorities demand a reliable medium for its transmission to the community. That's why Oklahoma City selected LOCK JOINT PRESTRESSED CONCRETE EMBEDDED CYLINDER PIPE to carry its vital supply of pure water from Atoka Reservoir to the state's capital.

The long life, permanent high carrying capacity and negligible maintenance inherent in Lock Joint Concrete Pressure Pipe make it ideal for the construction of this 60" aqueduct —the longest continuous water line ever built in the United States.

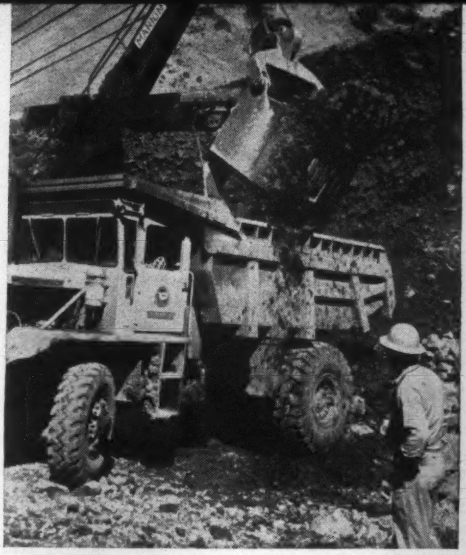
Economically, Lock Joint Pipe is also ideal. In addition to long term savings effected in low pumping costs and minimum maintenance, the production of the pipe locally at Ada will plow back more than $6,000,000 into the economy of the area through the use of local labor, services and materials.

LOCK JOINT PIPE CO.
Established 1905
P. O. BOX 269, EAST ORANGE, N. J.

Member of The American Concrete Pipe Association and The American Concrete Pressure Pipe Association

CONCRETE PRESSURE, SEWER, CULVERT & SUBAQUEOUS PIPE: PLASTIC PIPE AND PROTECTIVE COATINGS

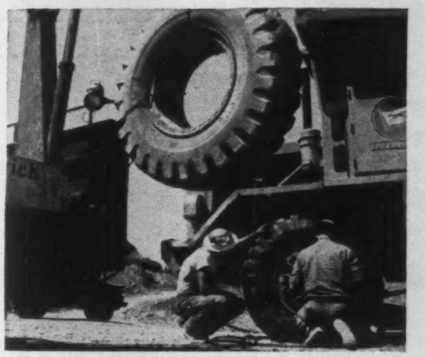
B.F.GOODRICH TIRES MOVE ROCK FILL FOR COUGAR DAM. Finished dam will tower 485 feet, stretch 1,600 feet, and slope from a base width of 1,500 feet to a crest width of 40 feet. Six-mile reservoir will provide water resources for flood control, power production and public recreation. $50-million project is scheduled to take four years.



30 TONS OF ROCK CRASH onto B.F. Goodrich Rock Service tires. Tires work two shifts a day on scrapers, bottom dumps, rear dumps, water wagons, graders, rollers and mobile cranes. Yet it's not unusual for tires to be retreaded twice.

CONTINUOUS TIRE INSPECTIONS play a key role in keeping M-C&S' equipment on the go. The B.F.Goodrich Unified Contractors Program helps contractors save on all their rubber products—and protective clothing—requirements. Ask your BFG dealer to show you how this new program can help *you.*

B.F. Goodrich helps move a mountain to build a dam



B.F.GOODRICH ON-THE-SPOT SERVICE helps M-C&S get the most out of equipment. Tire changes seldom take longer than 15 minutes. BFG Servicemobiles carry all the latest power tools, are manned by tire experts.

12-MILLION CUBIC YARDS OF ROCK AND EARTH FILL RIDE TO $50-MILLION COUGAR DAM PROJECT ON B.F.GOODRICH TIRES

They're changing the topography of Oregon's Willamette Valley. Rock quarried from a knob high above the South Fork McKenzie River is taxied down a tortuous road by a fleet of giant earth movers. It will become part of the fill for Cougar Dam, a Corps of Engineers flood control project that will be the largest structure of its type in the Northwest.

Altogether, general contractor Merritt-Chapman & Scott Corp. will move 12-million cubic yards—every one on B.F.Goodrich tires. You'll find B.F.Goodrich Rock Service tires with Cut Protected compound hard at work here. BFG developed this compound for jobs like Cougar Dam, where upwards of 30-ton loads must be carried over hard, rock-surfaced roads. It takes a mighty big boulder to gash this compound, and if it should, there's BFG Flex-Rite Nylon cord construction to withstand the impact (and resist heat blowouts and flex breaks too). No wonder many Rock Service tires at Cougar Dam can be retreaded twice.

B.F.Goodrich on-the-job service plays a key role in keeping M-C&S equipment on the go. All 600 BFG tires are inspected regularly. Tire changes seldom take longer than 15 minutes. There is a BFG tire warehouse and shop less than a mile from the project. A BFG tire record system keeps the contractor informed of costs and helps control inventory.

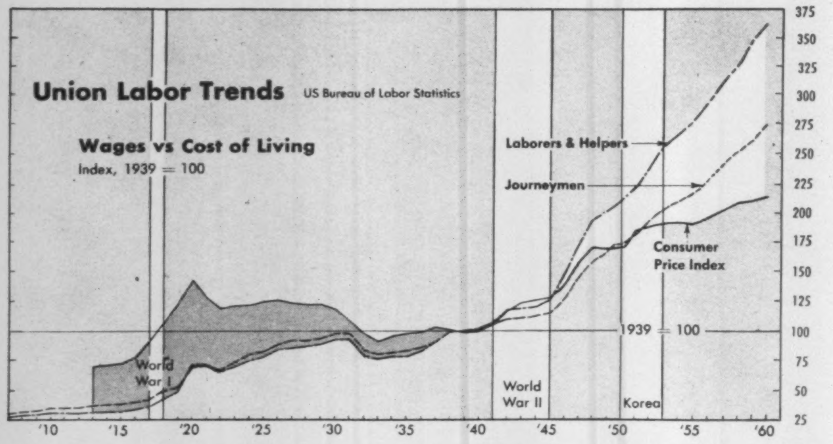
Supplying contractors with longer-wearing tires and dollar-saving service is an everyday job for B.F.Goodrich. On many projects B.F.Goodrich supplies everything from tires to boots to belts through its new Unified Contractors Program. Whatever *your* need, it will pay you to talk to your B.F.Goodrich dealer. His know-how can make a big difference in your profit picture. Look him up under Tires in the Yellow Pages. *The B.F.Goodrich Company, Akron 18, Ohio.*

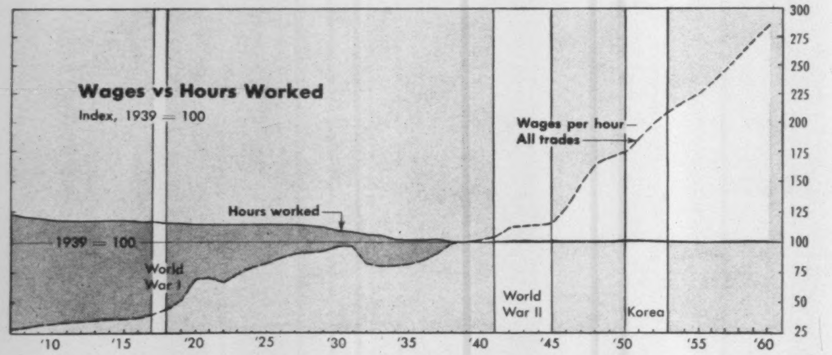
Specify **B.F.Goodrich Tubeless or tube-type tires when ordering new equipment**

CIRCLE 63 ON READER SERVICE CARD

B.F.Goodrich

Construction Wage Raises Outrun





BLS Trends in Individual Trades

Wages per Hour: Index 1939=100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians, Inside Wiring	Glaziers	Lathers	Painters	Plasterers	Plumbers	Sheet Metal Workers	Pipefitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907M	29.3	29.7	27.3	37.7	29.8	34.5	27.9	....	....	26.2	37.3	33.3	30.6	30.1	33.9	27.9	30.8	30.3
1913M	36.1	36.9	31.8	41.5	36.8	38.0	33.8	....	34.6	35.5	39.3	37.9	35.6	35.0	36.7	37.3	34.2	31.8
1926M	88.3	88.7	84.9	84.1	88.5	86.6	81.5	80.7	83.0	90.9	92.4	83.9	86.3	84.9	92.7	81.1	86.9	85.5
1930M	97.0	97.5	93.3	101.8	96.9	95.4	90.9	92.6	98.6	100.6	98.1	91.5	94.7	93.5	99.1	92.5	92.9	94.9
1932M	83.1	83.6	79.2	87.0	79.6	83.6	87.9	78.0	80.0	85.3	81.4	80.5	83.4	81.0	88.4	81.0	78.7	78.4
1938J	99.3	99.3	99.2	99.5	99.8	99.6	99.5	99.3	96.8	99.2	99.2	99.1	98.6	99.3	99.7	98.9	99.4	99.7
1942	111.9	110.9	117.5	108.3	112.1	110.8	113.5	108.8	109.1	110.5	105.0	110.5	116.0	109.3	108.0	108.7	119.6	115.7
1946	129.3	126.8	146.3	125.6	129.7	128.2	124.9	123.4	124.2	127.3	119.0	123.2	133.0	124.6	126.5	121.4	152.2	141.7
1949	170.3	166.1	199.8	174.0	169.1	165.8	168.1	160.5	164.2	162.1	161.9	162.8	169.6	161.3	175.7	157.4	208.4	190.4
1950	177.8	173.2	210.8	180.4	177.4	172.7	172.3	169.4	179.6	167.7	169.3	166.7	177.9	168.3	187.1	164.8	220.0	203.4
1951	189.1	184.0	225.3	188.0	189.1	183.7	185.4	177.8	188.0	178.7	177.5	176.6	188.1	178.6	193.6	175.7	235.6	213.9
1955	226.2	219.4	279.1	222.6	225.9	217.9	214.8	214.0	214.2	213.9	204.3	209.4	230.0	213.5	222.1	208.9	295.3	260.6
1956	237.1	229.2	295.9	232.6	235.4	228.4	226.6	225.2	223.3	222.5	212.1	218.7	240.4	223.3	232.1	217.7	312.1	281.2
1957	249.3	240.8	313.2	241.7	247.8	239.9	237.9	236.8	232.7	234.3	219.9	230.8	251.8	235.2	238.8	229.0	331.7	296.0
1958	260.7	251.6	328.4	249.8	259.4	249.9	250.5	248.4	242.6	242.7	226.9	240.5	265.9	247.3	247.7	236.7	348.1	310.5
1959	273.4	263.2	349.2	260.5	272.3	262.3	258.9	260.8	251.0	252.1	234.4	253.5	278.5	258.2	256.0	249.5	371.2	331.8
1960	284.6	273.7	365.2	268.5	283.3	272.2	272.3	272.2	259.9	263.1	244.2	261.5	291.2	267.6	264.6	258.2	388.6	345.3

Hours Worked per Week: Index 1939=100

Year	All Building Trades	Journeymen	Helpers & Laborers	Bricklayers	Carpenters	Cement Finishers	Electricians, Inside Wiring	Glaziers	Lathers	Painters	Plasterers	Plumbers	Sheet Metal Workers	Pipefitters	Stonemasons	Structural Ironworkers	Building Laborers	Bricklayers' Tenders
1907M	124.3	123.8	126.1	122.9	121.0	122.7	124.2	.....	.....	133.1	125.8	120.6	117.0	120.3	118.4	121.3	121.6	118.9
1913M	118.2	118.0	118.3	114.9	115.6	119.8	120.7	.....	121.8	125.9	124.3	119.2	114.9	118.0	115.7	114.1	118.3	116.0
1926M	114.9	115.1	113.9	113.3	113.5	113.4	115.9	117.5	118.9	120.7	118.2	116.5	111.8	114.4	114.5	112.8	112.1	113.9
1930M	109.8	110.0	109.0	107.1	109.4	108.1	109.9	112.4	110.4	115.4	113.0	109.9	106.9	108.5	107.1	108.8	110.0	106.9
1932M	106.5	106.6	105.7	103.1	105.0	105.6	106.2	107.9	109.3	114.2	110.1	108.0	103.6	105.4	104.8	104.8	104.9	104.0
1938J	100.2	100.1	100.2	99.0	100.0	100.0	100.2	100.2	100.8	110.4	100.0	99.7	100.0	99.6	100.1	100.1	100.1	100.3
1942	101.1	101.8	98.8	100.8	100.8	100.6	104.5	102.0	102.5	106.5	102.0	99.9	100.9	102.2	100.2	101.1	98.8	98.6
1946	100.2	101.1	97.5	100.3	103.3	100.4	100.4	102.0	102.2	106.1	104.1	98.3	100.8	101.3	100.0	101.1	97.2	96.9
1949	100.2	101.1	97.4	100.1	100.2	100.0	102.1	103.5	98.1	106.2	103.5	97.6	99.9	101.3	100.8	101.1	97.2	96.4
1950	100.3	101.2	97.4	100.1	100.2	100.0	102.1	103.5	100.2	106.2	105.9	98.2	99.9	101.3	100.8	101.1	97.2	96.4
1951	100.2	101.1	97.3	100.2	100.2	100.0	102.1	103.5	100.2	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.0	96.2
1955	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.2
1956	100.2	101.1	97.5	100.2	100.2	100.0	101.0	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.2
1957	100.2	101.1	97.5	100.2	100.2	100.0	101.1	103.5	99.8	104.9	105.9	98.2	99.9	101.3	100.9	101.1	97.1	96.2
1958	100.1	101.0	97.5	100.1	100.2	100.0	99.7	103.5	99.8	104.9	105.8	98.2	99.9	101.3	100.7	101.1	97.1	96.2
1959	100.1	101.0	97.5	100.1	100.2	100.0	99.7	103.5	99.8	104.9	106.1	98.2	99.9	101.3	100.7	101.1	97.1	96.2
1960	100.0	100.9	97.5	100.1	100.2	100.0	97.0	103.5	99.8	104.8	105.8	98.2	99.9	101.3	100.7	101.1	97.1	96.2

•M May 1. **•J June 1.** **• All others July 1.**

Today's labor union negotiator almost never demands a wage boost for its own sake. As a matter of fact, he is outwardly sympathetic with the cost squeeze on the construction men across the bargaining table, while maintaining that his heavy wage demands are necessary to "offset higher living costs".

While this argument bears the major responsibility for pushing building and construction costs into orbit, it hasn't had a shred of validity in a decade.

The white areas on the chart at the left show how long it has been since the U. S. Bureau of Labor Statistics "cost of living" index has come even close to matching the climb rate of the BLS index of construction trades journeymen's rates, much less the steep spiral in laborers' and helpers' wages.

In 1960, laborers' and helpers' rates jumped 4.6%. And journeymen's pay envelopes grew 4% fatter. Contrast that with a 1960 rise of only 1.4% in the BLS Consumer Price Index, the most widely used cost of living indicator!

Another BLS construction wage series blasts the union leaders' arguments that continuous wage boosts are needed to balance rising living costs. The regional analysis on the opposite page shows an average rise in nationwide building trades rates of 4.3% during 1960. In the nine regions of the United States covered by the survey, wage hikes ranging from 2.6% in the Middle West to 6.0% along the Pacific Coast easily outdistanced the 1.4% rise in living costs.

BLS is still compiling its trade-by-trade and region-by-region breakdowns of construction workers' wage rates in 1961. But you can get a clue to what the results will be by comparing the city-by-city wage rates in the table on the opposite page with the rates in effect last July (ENR Sept. 22, 1960, p. 63). Higher rates for most trades in most cities mark this as another year when wage increases more than offset rising living costs.

Cost of Living Index

1947-49=100

	1939	1949	1955	1957	1958	1959	1960	1961
Jan	59.6	102.7	114.3	118.2	122.3	123.8	125.4	127.4
Feb	59.4	101.6	114.3	118.7	122.5	123.7	125.6	127.5
Mar	59.3	101.9	114.3	118.9	123.3	123.7	125.7	127.5
Apr	59.2	102.1	114.2	119.3	123.5	123.9	126.2	127.5
May	59.1	101.8	114.2	119.6	123.6	124.0	126.3	127.4
Jun	59.0	102.0	114.4	120.2	123.7	124.5	126.5	127.6
Jul	59.2	101.4	114.7	120.8	123.9	124.9	126.6	128.1
Aug	59.0	101.6	114.5	121.0	123.7	124.8	126.6	.....
Sept	60.2	102.1	114.9	121.1	123.7	125.2	126.8	.....
Oct	60.0	101.5	114.9	121.1	123.7	125.5	127.3	.....
Nov	59.9	101.6	115.0	121.6	123.9	125.6	127.4	.....
Dec	59.6	101.0	114.7	121.6	123.8	125.5	127.5	.....

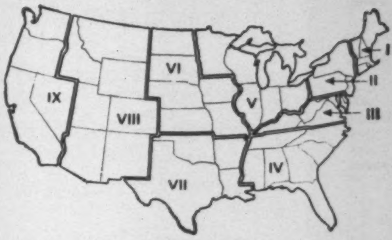
Pre-depr. high 77.0, Nov 1925—Depr. low 53.6, Apr 1933

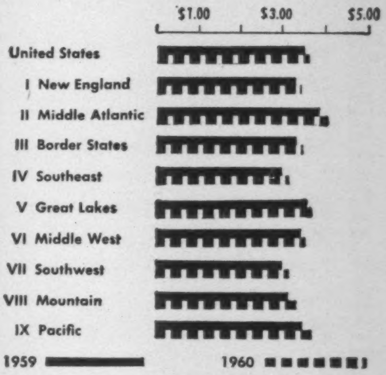
the Cost of Living

Costs Roundup—3rd Quarter

Union Wage Rates by Region—July 1, 1960

Trade	Region: US	New England I	Middle Atlantic II	Border States III	South-east IV	Great Lakes V	Middle west VI	South-West VII	Moun-tain VIII	Pacific IX
All building trades, July 1, 1960	$3.66	$3.44	$4.03	$3.42	$3.15	$3.71	$3.56	$3.14	$3.32	$3.72
Journeymen	$3.86	$3.70	$4.23	$3.74	$3.40	$3.86	$3.74	$3.46	$3.61	$3.89
Asbestos workers	3.90	3.98	4.24	3.94	3.48	3.94	3.78	3.72	3.67	3.91
Boilermakers	4.11	3.95	4.57	3.88	3.75	4.00	3.80	3.75	4.01	4.15
Bricklayers	4.17	3.90	4.55	3.97	3.82	4.10	4.07	3.88	3.91	4.17
Carpenters	3.78	3.51	4.28	3.60	3.20	3.80	3.66	3.31	3.48	3.71
Cement finishers	3.75	3.81	4.23	3.45	3.06	3.74	3.81	3.27	3.41	3.73
Electricians (inside wiremen)	4.00	3.85	4.21	3.92	3.57	3.99	3.82	3.71	3.82	4.31
Elevator constructors	3.95	3.84	4.25	3.87	3.58	3.98	3.81	3.68	3.73	4.01
Glaziers	3.53	3.34	3.82	3.43	2.80	3.63	3.58	3.00	3.05	3.64
Lathers	4.00	3.79	4.43	3.82	3.34	3.83	3.74	3.64	3.74	4.04
Machinists	3.96	3.90	4.17	3.87	....	3.95	3.78	3.66	4.04	4.11
Marble setters	3.91	3.87	4.10	3.83	3.80	3.86	3.82	3.60	3.39	4.01
Mosaic and terrazzo workers	3.93	3.86	4.36	3.69	3.61	3.75	3.82	3.36	3.63	3.81
Painters	3.55	3.25	3.60	3.41	3.11	3.62	3.56	3.18	3.22	3.67
Paperhangers	3.52	3.32	3.34	3.05	3.30	3.59	3.61	3.16	3.20	3.81
Pipefitters	4.00	3.84	4.29	3.83	3.59	3.97	4.03	3.71	3.91	4.17
Plasterers	4.06	3.77	4.59	3.79	3.31	3.89	3.80	3.56	3.80	4.02
Plumbers	4.01	3.83	4.25	3.85	3.61	3.93	3.93	3.61	3.89	4.22
Rodmen	3.86	4.17	4.36	3.82	3.37	3.99	3.69	3.33	3.61	3.70
Roofers, composition	3.61	3.69	4.06	3.00	2.75	3.79	3.42	2.86	3.34	3.59
Roofers, slate and tile	3.62	4.06	3.84	3.49	2.84	3.91	3.35	3.11	3.31	3.61
Sheet-metal workers	3.90	3.76	4.27	3.80	3.39	3.91	3.79	3.39	3.63	3.99
Stonemasons	4.04	3.95	4.10	4.13	3.91	3.88	3.97	3.96	4.00	4.20
Structural-iron workers	3.96	4.19	4.37	3.95	3.47	3.99	3.73	3.47	3.61	3.93
Tile layers	3.84	3.82	3.98	3.64	3.51	3.78	3.73	3.31	3.52	4.08
Helpers and laborers	2.88	2.72	3.28	2.38	1.97	3.01	2.74	1.96	2.40	3.12
Bricklayers' tenders	3.00	2.73	3.51	2.32	1.97	3.01	2.77	2.06	2.72	3.31
Building laborers	2.81	2.70	3.15	2.34	1.95	3.00	2.68	1.86	2.31	3.02
Composition roofers' helpers	2.51	2.68	2.94	2.47	1.84	2.65	2.75	1.78	....	2.69
Elevator constructors' helpers	2.84	2.69	3.14	2.80	2.52	2.81	2.67	2.55	2.65	2.81
Marble setters' helpers	3.07	2.91	3.35	2.84	....	3.07	2.83	2.18	2.75	3.11
Plasterers' laborers	3.18	2.86	3.36	2.58	2.01	3.15	3.02	2.12	2.83	3.95
Plumbers' laborers	2.77	....	3.05	2.48	1.94	3.09	3.01	2.06	2.66	2.95
Terrazzo workers' helpers	3.18	2.95	3.49	2.72	....	3.15	2.94	2.13	2.54	3.29
Tile layers' helpers	3.13	2.91	3.29	2.75	....	3.02	2.77	2.07	2.75	3.40





Union Wage Rates by City—July 1, 1961

Minimum base rate & fringe benefits

	Bricklayer	Carpenter	Electrician	Painter	Plasterer	Laborer
Albuquerque, N. M.	$4.320	$3.735+.075	$3.850	$3.200	$3.750	$2.240+.075
Burlington, Vt.	3.750	2.750	3.000	1.750	3.750	2.250
Butte, Mont	3.750	3.450	3.650+.0365	3.370+.09	3.500	2.650
Charlotte, N. C.	3.250	2.500	3.200+.032	a	2.750	1.500
Chattanooga, Tenn	4.075	3.300	3.750+.0375	3.150	3.500	2.100
Cheyenne, Wyo	4.000	3.230	3.680+.0368	3.250	3.500	2.200
Columbia, S. C.	3.000	2.500	3.350+.0335	2.500	3.000	a
El Paso, Tex	3.950	3.350	3.850+.0385	3.000	3.500	1.875
Erie, Pa	4.200+.10	3.715+.10	4.025+.0402	3.000	3.800+.10	2.775+.20
Evansville, Ind	4.000+.10	3.400+.075	3.760+.0376	3.200+.15	3.950	2.625+.075
Fargo, N. Dak	3.900	3.000	3.250	2.900	3.650	2.250
Grand Rapids, Mich	4.175+.10	3.600+.155	3.790+.2795	3.050+.20	3.600+.10	2.850+.08
Hartford, Conn	4.050+.24	3.750+.24	4.350+.1305	3.500+.10	4.050+.24	2.950+.09
Houston, Tex	4.000	3.665	3.925+.1892	3.485+.075	3.813+.10	2.100
Knoxville, Tenn	3.925	3.225	3.620+.0362	2.900	3.525	2.000
Lansing, Mich	4.200	3.630+.08	3.680+.3768	3.430+.20	3.800+.30	2.830+.08
Las Vegas, Nev	4.630	4.200+20	4.800+.1480	4.150+.09	4.350+.13	3.420
Little Rock, Ark	3.800	3.350	3.475+.0347	3.000	3.700	1.900
Madison, Wis	3.950	3.500	3.960+.0396	3.380+.10	3.700	2.950
Manchester, N. H.	3.975+.125	3.370	3.550+.1355	2.650+.125	3.975+.125	2.700
Memphis, Tenn	4.000+.15	3.450	3.725+.1372	3.300	3.600	2.050
Miami, Fla	3.870	3.600	3.870+.1961	3.370+.10	3.870	1.900
Mobile, Ala	3.800+.26	3.300+.125	3.850+.1385	3.300	3.650+.125	1.900+.125
Montgomery, Ala	3.250	3.000	3.100+.031	2.750	2.750	1.250
New Haven, Conn	4.000+.24	3.700+.23	4.075+.1407	3.550+.24	4.000+.24	2.950+.18
Norfolk, Va	3.750	2.980	3.650+.0365	3.050	3.550	1.650
Oakland, Calif	4.150+.35	3.950+.36	4.368+.3684	3.920+.345	4.040+.40	3.225+.10
Peoria, Ill	4.325+.125	4.025+.035	4.275+.0427	3.700	4.300+.10	3.375
Portland, Maine	3.500	3.050	3.300+.2330	2.250	3.500	2.200
Providence, R. I.	4.000+.20	3.550+.10	3.850+.1385	3.175+.10	3.925+.10	2.750+.10
Reading, Pa	4.000+.175	3.450	4.075+.0407	3.050+.11	3.850	2.510+.05
Richmond, Va	3.750	2.980	3.525+.0352	2.550	3.290	1.650
Rochester, N. Y.	4.385+.15	4.000	4.320+.1432	3.750	4.385+.15	2.980+.25
Rock Island, Ill	4.000	3.470	4.000+.0400	3.350+.10	3.950	2.730
Santa Fe, N. Mex	4.320	3.735+.075	3.850+.0385	3.200	3.750	2.240—.075
Savannah, Ga	3.750	3.250	3.650+.0365	2.750	2.750	1.650
Schenectady, N. Y.	4.050+.10	3.650+.075	4.200+.2420	3.300	4.050+.10	2.900+.10
Scranton, Pa	3.775+.10	3.200+.10	3.850+.1885	3.000	3.775	2.575
Shreveport, La	3.900	3.150	3.725+.0372	2.950	3.750	1.775
Sioux Falls, S. Dak	4.000	3.050	3.600+.036	2.700	3.400	2.175
South Bend, Ind	4,050+.10	3.500	3.850+.0385	3.200	3.660+.075	2.675+.075
Spokane, Wash	4.290+.10	3.630+.10	4.150+.0415	3.550+.10	3.950+.10	2.900+.10
Springfield, Mass	3.925+.1177	3.555+.11	3.900+.1890	3.300+.10	3.925+.1177	2.650+.075
Syracuse, N. Y.	4.200+.20	3.820+.20	4.350+.1935	3.500+.10	4.075+.20	3.050+.20
Tampa, Fla	3.600	3.400	3.900+.039	3.000	3.600	1.750
Washington, D. C.	4.300+.19	3.850+.09	4.550+.1455	3.825+.10	4.075+.30	2.650+.125
Wichita, Kans	4.050	3.400	4.000+.040	3.000	3.750	2.300
Wilmington, Del	4.125+.10	3.900	4.250+.1800	3.400+.10	4.000+.15	2.350+.075
Worcester, Mass	4.050+.15	3.800+.10	3.900+.139	3.350+.15	4.050+.15	2.900+.10
York, Pa	3.625	3.150+.05	3.750+.0875	2.700	3.600	2.100
Youngtown, Ohio	4.210+.10	3.930+.10	3.980+.2394	3.665+.10	4.000+.10	3.060+.10

•a No Union scale in effect on survey date

Average Hourly Earnings

BUILDING CONSTRUCTION

	1946	1949	1950	1955	1957	1958	1959	1960	1961
Jan	$1.40	$1.92	$1.98	$2.65	$2.92	$3.07	$3.19	$3.32	$3.47
Feb.	1.42	1.93	1.99	2.65	2.91	3.08	3.18	3.33	3.48
Mar.	1.41	1.93	2.00	2.63	2.91	3.06	3.17	3.38	3.46
Apr	1.42	1.93	1.99	2.63	2.92	3.06	3.17	3.32	3.47
May	1.43	1.93	2.00	2.63	2.94	3.06	3.17	3.34	3.47
June	1.44	1.92	2.00	2.64	2.94	3.06	3.17	3.33	3.47
July	1.47	1.92	2.01	2.66	2.96	3.09	3.20	3.37	....
Aug	1.48	1.93	2.02	2.67	2.97	3.09	3.23	3.37	....
Sept.	1.51	1.94	2.07	2.68	3.02	3.13	3.26	3.40	....
Oct	1.53	1.94	2.08	2.70	3.02	3.13	3.27	3.42	....
Nov	1.55	1.95	2.09	2.71	3.03	3.14	3.28	3.42	....
Dec	1.57	1.96	2.12	2.72	3.05	3.19	3.30	3.46	....

OTHER THAN BUILDING

	1946	1949	1950	1955	1957	1958	1959	1960	1961
Jan	$1.30	$1.71	$1.75	$2.31	$2.55	$2.71	$2.75	$2.88	$3.05
Feb	1.30	1.71	1.77	2.33	2.56	2.71	2.76	2.91	3.03
Mar.	1.28	1.70	1.77	2.31	2.55	2.71	2.74	2.99	3.00
Apr	1.31	1.71	1.75	2.34	2.58	2.68	2.75	2.87	3.03
May	1.31	1.71	1.76	2.34	2.61	2.69	2.76	2.90	3.06
June	1.31	1.70	1.76	2.34	2.62	2.67	2.79	2.91	3.08
July	1.36	1.71	1.78	2.36	2.65	2.71	2.81	2.96	....
Aug	1.35	1.71	1.79	2.38	2.67	2.73	2.82	3.00	....
Sept.	1.37	1.73	1.83	2.39	2.70	2.78	2.85	3.01	....
Oct	1.40	1.74	1.83	2.40	2.69	2.78	2.90	3.02	....
Nov	1.43	1.75	1.84	2.40	2.70	2.73	2.85	2.97	....
Dec	1.43	1.78	1.88	2.41	2.70	2.78	2.88	3.04	....

MANUFACTURING

	1946	1949	1950	1955	1957	1958	1959	1960	1961
Jan	$1.00	$1.41	$1.42	$1.84	$2.05	$2.10	$2.19	$2.29	$2.32
Feb	1.00	1.40	1.42	1.85	2.05	2.10	2.20	2.29	2.32
Mar.	1.04	1.40	1.42	1.85	2.05	2.11	2.22	2.29	2.32
Apr	1.06	1.40	1.43	1.86	2.05	2.11	2.23	2.28	2.33
May	1.07	1.40	1.44	1.87	2.06	2.11	2.23	2.29	2.34
June	1.08	1.41	1.45	1.87	2.07	2.12	2.24	2.29	2.35
July	1.09	1.41	1.46	1.89	2.07	2.13	2.23	2.29	2.35
Aug	1.11	1.40	1.46	1.88	2.07	2.13	2.19	2.27	....
Sept	1.13	1.41	1.48	1.90	2.08	2.14	2.22	2.30	....
Oct	1.14	1.39	1.50	1.91	2.09	2.14	2.21	2.30	....
Nov	1.15	1.39	1.51	1.93	2.11	2.17	2.23	2.30	....
Dec	1.16	1.41	1.54	1.93	2.10	2.19	2.27	2.32	....

* Series revised March, 1948 to cover both public and private contract construction and to include workers engaged in off-side operations for construction as well as site workers

Base Rates on Compensation Insurance for Construction—July 1, 1961

Data Compiled by Herbert L. Jamison & Co., Insurance Advisors and Auditors, New York, N. Y.—(Base Rates in effect July 1, 1961—subject to increase or decrease according to experience ratings)

Classification of Work	Ala.	Alaska	Ariz.	Ark.	Cal.	Colo.	Conn.	Del.	D. C.	Fla.	Ga.	Hawaii	Idaho	Ill.	Ind.	Iowa	Kan.	Ky.	La.	Me.	Md.	Mass.	Mich.	Minn.	Miss
Carpentry—1, 2 family residence	$1.44	$2.14	$3.61	$3.89	$3.36	$2.28	$2.98	$1.80	$3.66	$3.49	$2.19	$4.22	$2.71	$2.55	$1.64	$1.83	$3.03	$1.89	$4.93	$1.49	$2.75	$3.63	$2.79	$2.70	$3.89
Carpentry—3 stories or less	1.77	2.14	3.61	4.49	3.36	2.66	2.98	1.80	3.66	3.49	2.19	3.15	2.71	3.20	2.14	2.27	3.15	2.31	6.33	1.49	2.75	4.32	2.79	2.70	3.89
Carpentry—interior trim—cab wk.	.81	2.07	3.61	2.05	3.36	1.25	2.18	1.80	2.59	2.53	1.13	3.79	1.47	1.56	.99	1.01	1.71	1.08	2.94	.75	2.63	1.81	1.78	2.70	2.49
Carpentry—general	1.92	3.00	3.61	4.74	5.84	2.83	4.38	1.80	5.06	5.71	3.35	5.12	3.59	4.05	3.17	2.73	5.63	2.74	7.36	2.33	4.82	10.45	2.79	4.82	6.40
Chimney construction—brick con.	5.48	2.31	5.00	14.65	16.58	9.70	13.23	1.80	18.44	16.27	5.13	12.54	12.31	10.21	7.34	6.81	13.56	9.39	21.68	5.11	14.00	7.64	11.50	10.77	17.17
Concrete work—bridges, culverts—c	3.04	6.98	6.05	5.82	7.44	5.54	7.14	1.80	10.94	6.91	3.69	7.18	6.09	4.71	2.33	4.34	5.08	2.72	8.25	3.53	7.19	3.93	4.89	6.22	9.01
Concrete work—dwellings—1, 2 families	.95	5.14	2.56	1.98	1.31	1.62	2.53	1.80	4.62	2.98	.94	3.00	2.57	1.13	1.21	1.21	2.12	1.40	2.58	1.32	2.43	3.47	2.48	2.00	2.38
Concrete work—N.O.C.	2.17	2.31	2.56	5.08	4.26	3.77	4.18	1.80	5.67	6.02	2.31	4.54	2.48	3.34	2.64	2.89	5.08	2.19	6.38	1.83	4.27	5.69	3.53	2.87	4.18
Concrete or cement work—floors, sidewalks	.80	3.55	2.56	1.90	1.45	1.27	2.85	1.30	2.22	3.29	1.31	3.02	2.00	1.69	1.05	1.46	2.07	1.09	3.40	.95	2.94	3.61	1.78	2.19	2.00
Electrical wiring—inside	1.24	1.36	1.67	1.71	2.01	1.39	1.24	.95	2.30	1.99	1.38	2.09	2.26	1.36	.87	.86	1.50	1.04	2.12	.74	1.96	1.57	1.28	1.35	2.25
Excavation—earth—N. O. C.	2.05	5.89	2.89	3.62	3.03	3.34	4.14	1.70	3.89	4.12	2.63	5.59	3.12	2.15	2.06	2.36	4.05	2.31	4.56	1.47	3.55	4.08	3.42	4.82	6.09
Excavation—rock	3.23	7.36	4.67	6.73	9.43	5.80	7.46	1.70	11.77	9.89	4.60	8.36	5.08	7.78	4.42	3.62	7.97	5.59	14.31	3.25	8.01	6.82	5.52	3.94	12.10
Glaziers	2.18	3.30	2.89	5.26	3.31	3.26	4.93	1.40	6.08	5.39	3.10	5.03	4.07	2.27	2.33	2.59	4.56	3.19	5.68	2.04	5.14	4.16	4.09	4.49	5.99
Insulation work	1.06	3.90	2.52	2.18	5.47	1.94	2.56	1.80	2.93	2.48	1.31	2.66	2.39	2.27	1.21	1.37	2.23	1.41	4.04	1.29	2.09	3.21	1.60	3.25	3.04
Lathing	1.00	2.99	2.26	2.71	2.45	1.65	2.50	.80	2.81	2.57	1.56	2.76	1.97	1.05	1.27	1.31	2.14	1.43	3.89	1.01	2.26	3.46	1.31	1.62	3.20
Masonry	.95	3.11	2.33	2.00	3.02	1.62	2.82	1.00	2.58	2.68	1.13	3.08	2.57	1.75	1.29	1.21	2.20	1.43	2.58	1.32	2.84	3.47	2.07	1.77	2.38
Painting and decorating	1.47	2.95	2.47	2.79	4.51	1.71	3.37	1.10	4.64	3.74	1.58	2.64	2.60	2.34	2.38	1.69	2.49	2.01	3.65	1.38	3.29	3.70	2.76	2.22	3.78
Pile Driving	5.57	11.45	11.55	14.11	14.90	9.25	4.66	6.30	12.19	8.69	6.61	13.35	11.30	6.37	5.01	4.76	11.95	7.19	11.87	2.55	7.42	7.35	6.65	7.22	20.11
Plastering	1.06	2.34	2.52	2.18	2.45	1.94	2.56	.80	2.93	2.63	1.31	2.66	2.39	1.61	1.21	1.37	2.23	1.41	3.09	1.29	2.09	2.62	1.60	1.74	3.04
Plumbing	.90	1.37	2.08	2.01	2.00	2.07	1.93	.70	2.61	2.27	1.60	2.31	1.41	1.75	1.36	1.37	1.84	1.19	3.40	.83	2.35	2.00	1.63	2.44	2.17
Roofing	2.56	7.27	5.60	7.51	8.92	5.69	6.95	2.45	7.42	7.18	4.92	7.83	7.32	6.20	5.50	5.64	8.17	5.17	7.66	5.01	7.65	13.03	7.52	6.49	12.28
Sheet metal work—erection, installation and repair	1.47	1.88	2.39	3.26	2.40	1.81	2.97	2.45	2.63	3.59	2.09	2.61	2.14	2.01	1.52	1.68	2.78	1.75	3.22	1.11	3.04	3.14	2.42	2.14	5.30
Steel erection—doors and sash	1.36	4.19	1.39	3.36	2.58	2.51	3.90	5.10	4.38	3.61	1.87	2.97	2.75	1.70	1.97	1.74	2.93	2.04	4.73	1.41	3.27	3.61	2.64	2.64	4.30
Steel erection—interior ornament	1.36	4.19	1.39	3.36	2.58	2.51	3.90	5.10	4.38	3.61	1.87	2.97	2.75	1.70	1.97	1.74	2.93	2.04	4.73	1.41	3.27	3.61	2.64	2.64	4.30
Steel erection—structural	5.17	30.94	12.67	15.43	16.86	10.28	10.51	5.10	29.52	13.38	10.74	26.31	11.91	11.00	6.05	8.53	13.98	9.95	10.73	5.58	14.36	15.87	14.20	11.02	13.69
Steel erection—dwelling—2 stories	3.21	11.47	5.56	8.01	5.98	6.05	7.37	5.10	9.79	7.85	4.88	8.63	7.87	6.27	3.42	4.49	8.08	4.21	9.81	2.99	7.50	11.76	4.69	7.31	9.21
Steel erection—N.O.C.	3.83	10.32	12.67	10.16	8.59	9.30	7.37	5.10	18.93	12.02	7.98	26.31	10.86	9.04	6.05	6.99	9.41	6.49	10.73	3.57	12.08	13.07	6.65	6.25	13.69
Tile work—interior	.66	.88	1.44	1.76	1.19	1.12	1.64	.50	2.48	1.84	.95	1.40	1.23	1.15	.85	.84	1.54	.90	2.00	.69	1.62	2.32	1.48	1.52	2.09
Timekeepers and watchmen	1.50	5.07	1.78	3.25	2.29	2.39	4.27	B	3.96	4.21	2.25	2.80	3.03	3.02	2.14	1.89	3.57	2.14	5.41	1.51	3.78	5.99	3.05	3.20	3.93
Waterproofing—interior (brush)	1.47	2.95	2.47	2.79	4.51	1.71	3.37	1.10	4.64	3.74	1.58	2.64	2.60	2.34	2.38	1.69	2.49	2.01	3.65	1.38	3.29	3.70	2.76	2.22	3.78
Waterproofing—trowel—interior	1.06	2.34	2.52	2.18	2.45	1.94	2.56	.80	2.93	2.63	1.31	2.66	2.39	1.61	1.21	1.37	2.23	1.41	3.09	1.29	2.09	2.62	1.60	1.74	3.04
Waterproofing—trowel—exterior	.95	3.11	2.33	2.00	3.02	1.62	2.82	1.00	2.58	2.68	1.13	3.08	2.57	1.75	1.29	1.21	2.20	1.43	2.58	1.32	2.84	3.47	2.07	1.77	2.38
Waterproofing—pressure gun	2.17	2.31	2.56	5.08	4.26	3.77	4.18	1.80	5.67	6.02	2.31	4.54	2.48	3.34	2.64	2.89	5.08	2.19	6.38	1.83	4.27	5.69	3.53	2.87	4.18
Wrecking	8.71	11.96	13.33	21.16	32.02	15.50	15.33	8.00	18.92	19.32	9.14	30.05	17.87	13.20	8.10	10.46	13.56	11.25	22.33	8.39	21.43	26.91	10.66	16.22	18.75

Classification of work	Mo.	Mont.	Neb.	D Nev.	N.H.	N.J.	N.M.	N.Y.	N.C.	D N.D.	D Ohio	Okla.	D Ore.	Pa.	R. I.	S. C.	S. D.	Tenn.	Tex.	Utah	Vt.	Va.	D Wash.	D W. Va.	D Wis.	D Wyo.
Carpentry—1, 2 family residence	$2.91	$3.28	$2.04	$4.49	$2.14	$3.60	$3.35	$3.40	$3.15	$2.61	$1.73	$4.68	$4.45	$1.50	$2.82	$3.20	$1.23	$2.96	$4.22	$1.53	$2.28	$1.77	$3.87	$1.89	$2.20	$1.35
Carpentry—3 stories or less	2.91	3.28	2.45	4.49	2.14	3.90	3.88	4.40	3.15	2.61	2.26	5.08	4.55	1.50	3.22	3.24	1.23	3.00	4.22	1.53	2.28	1.86	3.98	2.31	2.52	1.35
Carpentry—interior trim—cab wk.	2.40	1.61	1.16	2.21	1.01	2.00	1.80	4.40	1.66	2.61	1.04	4.05	2.06	1.50	2.32	1.74	2.85	1.55	2.74	1.53	1.06	1.14	1.27	1.08	2.20	1.35
Carpentry—general	3.93	6.94	3.40	9.51	2.32	4.70	5.69	4.40	3.54	4.66	3.34	6.85	5.23	1.50	6.05	5.48	2.36	3.44	5.83	1.53	3.02	2.64	5.11	2.74	3.73	1.35
Chimney construction—brick con.	15.71	14.45	8.75	19.80	7.15	11.90	11.95	29.60	11.67	10.41	7.74	20.55	9.24	1.60	19.35	15.24	4.62	11.28	15.53	7.43	7.47	6.74	9.74	9.33	10.81	6.56
Concrete work—bridges, culverts—c.	5.06	6.43	3.84	8.81	3.48	5.70	9.76	5.30	4.31	6.01	2.46	13.59	6.38	1.60	7.20	9.41	2.97	3.86	9.95	3.60	4.63	2.34	5.78	2.72	4.34	3.17
Concrete work—dwellings—1, 2 families	2.19	3.03	1.47	4.15	1.68	2.75	1.61	5.60	1.31	1.93	1.28	2.60	3.97	1.60	3.02	1.42	1.06	1.62	2.80	1.80	2.17	.87	3.63	1.40	1.72	1.58
Concrete work—N. O. C	5.74	6.24	4.20	8.55	1.96	5.70	2.98	5.60	3.01	2.78	2.78	10.39	4.53	1.60	8.44	2.98	2.47	2.96	5.83	3.02	3.03	2.73	4.20	2.19	3.04	2.66
Concrete or cement work—floors, sidewalks	2.19	1.99	1.52	2.73	1.27	2.55	2.32	2.70	1.66	2.12	1.11	2.99	2.24	.90	2.61	2.19	1.02	1.39	2.80	.92	1.34	1.26	1.94	1.09	1.83	.81
Electrical wiring—inside	1.75	1.56	1.43	2.14	1.04	2.30	1.76	2.50	1.49	1.31	.92	2.53	2.15	.85	1.08	2.22	.83	1.41	2.17	1.34	1.13	1.20	1.95	1.04	1.42	1.18
Excavation—earth—N. O. C.	4.62	4.40	2.34	6.03	2.53	4.20	3.06	5.80	3.25	4.66	2.17	5.55	5.08	2.00	3.78	4.04	1.61	3.49	4.27	1.96	3.35	2.18	4.40	2.31	3.58	1.72
Excavation—rock	8.18	7.86	6.56	10.77	4.57	7.90	6.17	6.90	9.17	3.81	4.66	6.87	10.15	2.00	9.56	8.61	2.90	5.49	10.11	2.74	5.02	4.14	9.32	5.59	7.81	2.41
Glaziers	3.42	4.88	3.27	6.69	2.77	4.70	4.73	5.60	3.99	4.34	2.46	5.17	4.70	1.20	6.88	5.65	2.05	3.85	3.23	.96	2.94	2.39	4.35	3.19	3.61	.84
Insulation work	2.50	2.74	1.38	3.75	1.47	4.20	3.14	3.50	1.46	3.14	1.28	4.81	4.00	1.50	2.97	2.16	1.31	1.79	4.45	1.94	1.74	1.01	3.40	1.41	2.82	1.71
Lathing	1.94	2.17	1.51	2.97	1.31	2.50	2.07	2.70	1.97	1.57	1.34	2.64	3.90	.80	3.10	2.63	1.02	2.10	2.11	1.37	1.38	1.46	3.30	1.43	1.55	1.21
Masonry	2.59	3.03	1.47	4.15	1.68	3.70	2.54	4.50	1.31	1.71	1.36	2.72	4.07	1.15	3.11	1.43	1.06	1.65	3.20	1.32	2.17	.92	3.77	1.43	1.92	1.16
Painting and decorating	2.34	4.34	2.13	5.95	2.28	5.20	2.53	4.90	2.30	2.15	2.51	3.85	4.55	2.10	2.35	4.21	1.67	1.94	3.25	1.12	1.94	2.34	4.19	2.01	2.46	.99
Pile driving	6.99	12.79	6.92	17.52	3.64	8.40	12.28	7.50	7.71	6.98	5.28	16.58	11.09	2.25	7.87	10.39	5.55	10.55	16.32	4.58	3.87	5.61	9.79	7.19	9.55	4.03
Plastering	1.55	2.74	1.38	3.75	1.47	2.50	3.14	3.40	1.46	1.68	1.28	3.86	4.00	.80	2.97	2.16	1.31	1.98	3.67	1.94	1.74	1.01	3.40	1.41	1.52	1.71
Plumbing	2.68	1.91	1.17	2.62	1.15	2.60	2.34	3.00	1.59	2.36	1.43	2.80	1.90	.85	1.76	2.18	.86	1.73	2.80	1.19	1.43	1.08	1.72	1.19	1.61	1.05
Roofing	6.04	9.43	5.95	12.91	5.64	11.20	9.09	9.40	5.36	6.28	5.80	16.36	10.87	2.45	9.06	5.61	3.94	5.50	9.13	4.42	6.02	3.86	11.97	5.17	9.92	3.89
Sheet metal work—erection, installation and repair	2.94	2.60	1.82	3.56	1.41	2.70	2.42	4.30	2.52	2.07	1.60	3.92	4.38	2.45	2.77	3.77	1.32	2.59	4.59	1.51	1.71	1.65	3.75	1.75	1.72	1.33
Steel erection—doors and sash	2.50	3.05	2.16	4.18	1.83	5.10	3.03	3.00	2.63	2.55	2.08	4.71	3.47	4.70	4.37	3.36	1.45	2.76	3.58	1.38	1.95	1.94	2.73	2.04	3.25	1.21
Steel erection—interior ornament	2.50	3.05	2.16	4.18	1.83	5.10	3.03	3.00	2.63	2.55	2.08	4.71	3.47	4.70	4.37	3.36	1.45	2.76	3.58	1.38	1.95	1.94	2.73	2.04	3.25	1.21
Steel erection—structural	11.89	17.45	7.82	23.91	9.27	12.70	10.77	14.30	14.79	10.66	6.38	16.53	17.60	4.70	17.37	15.41	5.74	7.36	15.52	5.69	10.69	5.76	15.86	9.95	9.52	5.01
Steel erection—dwelling—2 stories	8.17	8.50	5.38	11.65	4.15	6.90	8.32	4.40	15.60	7.07	3.31	12.70	8.10	4.70	10.08	10.69	3.05	4.64	15.52	4.22	5.10	3.50	7.51	4.21	5.18	3.71
Steel erection—N. O. C.	10.74	14.71	7.82	20.15	7.22	8.20	10.77	12.80	7.99	6.04	6.38	16.53	10.33	4.70	14.70	12.45	3.19	5.96	7.33	5.69	7.63	3.98	10.56	6.49	12.84	5.01
Tile work—interior	1.52	1.35	1.02	1.85	.91	1.85	1.57	2.20	1.12	1.47	.90	2.14	1.48	.65	1.97	1.62	.74	1.01	1.83	1.43	.98	.86	1.38	.90	1.07	1.26
Timekeepers and watchmen	4.49	3.43	2.35	4.70	1.98	2.55	3.52	3.10	2.92	3.09	2.26	3.98	3.99	B	4.82	3.26	1.67	3.14	1.92	2.03	2.12	1.94	4.18	2.14	3.32	1.79
Waterproofing—interior (brush)	2.34	4.34	2.13	5.95	2.28	5.20	2.53	4.90	2.30	2.15	2.51	3.86	4.55	2.10	2.35	4.21	1.67	1.94	3.25	1.12	1.94	2.34	4.19	2.01	2.46	.99
Waterproofing—trowel—interior	1.55	2.74	1.38	3.75	1.47	2.50	3.14	3.40	1.46	1.68	1.28	3.86	4.00	.80	2.97	2.16	1.31	1.98	3.67	1.94	1.74	1.01	3.40	1.41	1.52	1.71
Waterproofing—trowel—exterior	2.59	3.03	1.47	4.15	1.68	3.70	2.54	4.50	1.31	1.71	1.36	2.72	4.07	1.15	3.11	1.43	1.06	1.65	3.20	1.32	2.17	.92	3.77	1.43	1.92	1.16
Waterproofing—pressure gun	5.74	6.24	4.20	8.55	1.96	5.70	2.98	5.60	3.01	2.78	2.78	10.39	4.56	1.60	8.44	2.98	2.47	2.96	5.83	3.02	3.03	2.73	4.20	2.19	3.04	2.66
Wrecking	18.03	20.42	12.59	27.98	11.29	19.40	19.28	A	13.08	15.68	8.54	19.22	23.11	13.35	24.16	22.19	8.63	13.73	21.17	15.42	11.93	6.39	21.52	11.25	12.89	14.45

*A Specially rated—refer to company. *B Assigned to main classification. *C Includes form work. *D Subscription to State Fund mandatory; Industrial Commission, Carson City, Nev.; Workman's Compensation Bureau, Bismarck, N. Dak.; The Industrial Commission of Ohio, Columbus, Ohio; Industrial Accident Commission, Salem, Ore.; Department of Labor and Industry, Olympia, Wash.; State Compensation Commission, Charleston, W. Va.; Workman's Compensation Dept., State Treasurer's Office, Cheyenne, Wyo.
*N.O.C. Not otherwise classified.

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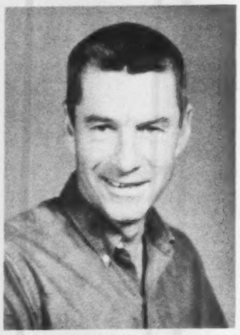

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Costs Roundup—3rd Quarter

Building Contractors' Bid Prices Rise

Building contractors' selling prices are moving up, after lagging behind basic costs for several months.

The latest values of six leading building contractor selling price indexes are all higher than three months ago. And all but one are above their values at this time last year.

The general building price index for the Detroit area, compiled by Smith, Hinchman & Grylls (architect-engineers) is under its year-ago value. But compared with the most recent value available three months ago, the index is up 1.8%, reversing a year-long downtrend. This index corrects for productivity.

Turner Construction Co.'s Eastern cities index is 1.5% above both April and last July. This index hadn't changed since July '59, despite steady increases in basic costs.

Among the industrial building price indexes, the June value of the Austin Co.'s index for the Central and Eastern states is 0.5% higher than three months earlier. Compared with June 1960, this index is up 0.5%.

Fruin-Colnon Contracting Co.'s St. Louis area industrial building price index rose 0.5% in June and held onto the gain in July and August. Compared with last August, it's 1.9% higher.

The semi-annual industrial building price index compiled by the Aberthaw Construction Co. for the New England area is 0.8% above December '60 and 2.7% over last June.

The uptrend in these contractors' selling price indexes is keeping step with the movement of the leading cost indexes. These are rising in response to the 1961 round of wage increases.

Three widely used valuation indexes are on the upside as we go to press. The American Appraisal Co.'s 30-cities industrial building cost index for July is 1.0% higher than in April. Compared with last July, it's up 2.8%. E. H. Boeckh & Associates 20-areas commercial and factory building cost index has risen every month since March. Its latest value, covering July, is 1.5% higher than March and 1.1% above July '60. Marshall & Stevens Co.'s U.S. average industrial building cost index for the second quarter is 0.5% higher than it was three months earlier. It tops the second quarter of '60 by the same percentage.

Three general purpose cost indexes, the Associated General Contractors of America's index and ENR's Construction and Building Cost Indexes, show a "leveling off" of costs after the sharp increases of the spring and early summer. This reflects lower prices for some construction materials, notably lumber, and the finishing up of the year's round of wage hikes.

Seven of the individual cities indexes included in ENR's 20-cities Construction Cost Index rose during the third quarter and seven went down. Construction costs in Dallas registered the largest gain in the past quarter, 3.1%. Cincinnati and Boston came next with construction cost increases of 2.5% and 2.0% respectively.

Four of ENR's 20 cities had lower building cost indexes in the third quarter, while building costs were on the upside in 11 other cities.

Construction and Building Cost Indexes

NAME, AREA & TYPE	Bases = 100 orig	Used Here	1949	1957	1958	1959	1960	1961 Apr.	May	June	Jul.	Aug.	Sept.
General Purpose Cost Indexes													
ENR Construction Cost, 20-cities aver†	1913	Same	477	724	759	797	824	838	847	850	854	854	854
ENR Building Cost, 20-cities aver†	1913	Same	352	509	525	548	559	565	569	570	572	571	571
Assoc. General Contractors, 12-cities aver†	1913	Same	342	483	499	517	534	538	542	547	547	547	...
U. S. Dept of Commerce, composite	1947–49	1915	363	482	486	496	504	511	514	511	511p	511p	...
Contractor Price Indexes—Building													
Aberthaw, New England, Industrial	1913	Same	312	453	453	473	486	...	...	494	...	...	...
Austin, Central & Eastern, Industrial	1926	1913	307	420	427	429	431	...	...	433	...	...	...
Fruin-Colnon, St. Louis, Industrial	1926	1913	382	512	530	551	571	580	583	583	583	...	...
Fuller, Eastern Cities, General	1913	Same	382	504	526	545	559	570	...	...	580	...	...
Turner, Eastern Cities, General	1939	1913	413	576	576	587	589	589	...	...	598	...	...
Smith, Hinchman & Grylls, Detroit, General #*	1926	1913	395	568	565	575	583	564	568	570	574	...	...
Valuation Indexes													
American Appraisal, 30-cities, Industrial*	1913	Same	490	663	682	704	722	735	737	740	742	...	...
E. H. Boeckh, 20-areas; Comm'l & Factory*	1926–29	1913	369	507	517	535	544	544	548	550	551	...	...
Marshall & Stevens, nat'l aver., Industrial	1926	1913	365	515	528	544	554	554	...	557	...	...	...

* Adjusted for productivity † No adjustment for productivity p preliminary # Architect-Engineers

ENR Cost Indexes for 22 Cities—1913=100

Construction Cost Index

City	Sep '49	'59	1960 Mar	Jun	Sep	Dec	1961 Mar	Jun	Sep
Atlanta	345	624	639	633	650	653	652	658	648
Baltimore	424	745	740	755	755	753	754	756	756
Birmingham	389	652	653	654	674	674	674	680	680
Boston	525	836	833	836	833	849	853	867	885
Chicago	541	923	919	919	917	911	905	948	947
Cincinnati	496	818	815	845	844	839	837	845	866
Cleveland	525	925	920	944	943	944	946	976	978
Dallas	394	604	604	629	639	640	640	640	660
Denver	470	742	758	752	756	756	756	779	777
Detroit	514	945	946	966	964	964	963	984	984
Kansas City	511	803	798	823	818	813	812	838	838
Los Angeles	489	877	870	870	908	901	897	942	940
Minneapolis	512	860	860	890	890	885	897	913	913
New Orleans	379	635	644	649	640	649	654	661	670
New York	533	1016	1011	1008	1038	1036	1057	1059	1078
Philadelphia	517	795	793	830	830	830	830	848	844
Pittsburgh	492	858	870	885	885	885	885	885	898
St. Louis	524	880	880	900	895	901	900	920	915
San Francisco	483	858	851	885	883	876	877	921	917
Seattle	530	839	859	857	855	853	882	887	887
Montreal	396	620	630	650	650	649	648	642	641
Toronto	...	666	673	697	692	690	687	691	701
U. S. Average	480	812	813	827	831	831	834	850	854

Building Cost Index

City	Sep '49	'59	1960 Mar	Jun	Sep	Dec	1961 Mar	Jun	Sep
Atlanta	309	497	503	498	501	504	504	512	504
Baltimore	354	553	553	562	561	559	560	563	563
Birmingham	330	513	517	518	526	526	527	534	535
Boston	361	566	565	566	567	572	576	588	594
Chicago	352	586	582	594	592	586	580	596	595
Cincinnati	362	540	540	551	549	545	543	552	555
Cleveland	342	558	553	562	560	562	563	574	575
Dallas	316	490	491	519	524	525	527	530	531
Denver	359	540	542	545	551	552	553	554	558
Detroit	351	599	599	608	605	605	605	614	614
Kansas City	357	558	553	562	559	553	553	562	562
Los Angeles	336	560	566	566	569	561	557	570	579
Minneapolis	361	569	570	573	581	576	575	587	587
New Orleans	325	508	514	517	507	508	507	513	517
New York	397	652	646	647	648	645	662	668	670
Philadelphia	394	582	580	585	589	590	589	595	588
Pittsburgh	375	610	609	618	621	626	625	626	630
St. Louis	379	579	579	583	579	576	581	585	581
San Francisco	341	551	553	554	560	553	554	566	571
Seattle	340	508	504	504	506	504	507	515	519
Montreal	316	457	459	466	466	464	464	458	451
Toronto	...	497	495	497	492	492	489	493	493
U. S. Average	352	556	555	561	563	562	562	570	571

• How to convert ENR Indexes

To convert from 1913=100 base to base year below*	Divide 1913=100 values of Construction Cost Index by...	Building Cost Index by...
1949=100	4.7702	3.5179
1947–49=100	4.5033	3.3642
1940=100	2.4196	2.0281
1939=100	2.3551	1.9744

Conversions to other base years are made by simple ratios:

$$I_{nb} = \frac{I_{ob}}{I_{nby}} \times 100$$

where I_{nb} is index on new base
I_{ob} is index value on old base
I_{nby} is old base index value for new base year

* Applies to 20-cities index, not to individual cities

Monthly Index History

Historical record of ENR Cost Indexes, graphs and tables for all years 1913-61 is in the supplement of Engineering News-Record, *Mar. 23, 1961. Reprints are available at $0.50 each from Business News Department, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.*

Public Utility and Railroad Cost Indexes

Lower equipment costs are helping public utility companies hold down total electric power plant costs despite higher construction costs for the plant buildings, according to the Handy-Whitman Public Utility Cost Indexes, compiled by Whitman, Requardt & Associates of Baltimore. Total gas plant costs, however, are rising.

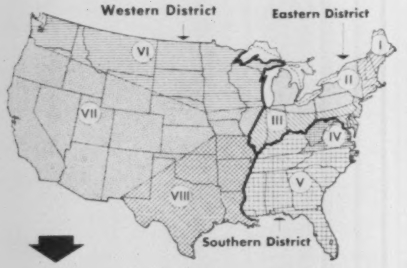
The July indexes, latest available, show that reinforced concrete plant building costs increases since January ranged from 0.3% in Handy-Whitman's North Central Division (see map) to 1.5% along the Pacific Coast. Only in the North Atlantic states were these costs slightly lower than at the beginning of the year.

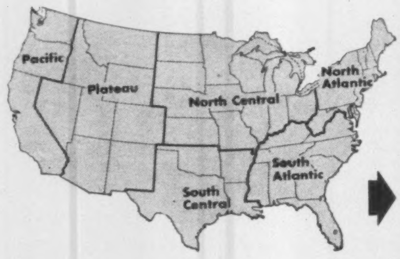
Brick plant building costs are on the rise in every one of the six regions of the United States covered by the Handy-Whitman indexes. Increases ran from 0.5% in the North Atlantic Division to 1.9% in the South Central and Plateau Divisions.

A 2.8% slide in gas plant mechanical equipment was unable to offset these higher building costs. And total gas plant construction costs averaged 0.5% to 1.7% higher in the six Handy-Whitman Divisions compared with January.

In electric light and power plant construction, however, the utility companies really got a cost break. Probably reflecting a more competitive market as a result of the breakup of the electrical equipment price-fixing conspiracy, accessory equipment costs are down from 4% in the South Atlantic Division to 4.4% in the North Atlantic. Substation equipment costs plummeted 5.3% to 6.6%.

These sharp declines in equipment costs trimmed the total costs of steam-powered electric generating plants 0.7% to 1.6%.





Railroad Cost Indexes

Interstate Commerce Commission, 1910-14 = 100

Station and Office Buildings

Region	1926	1932	1939	1945	1949	1955	1956	1958	1959	1960
US	**184**	**141**	**166**	**244**	**368**	**460**	**480**	**515**	**531**	**539**
I	183	142	167	238	361	449	468	502	518	525
II	185	142	168	244	371	460	479	514	531	539
III	185	142	168	241	369	466	486	521	538	546
IV	183	136	160	248	367	457	477	512	529	536
V	180	136	160	248	369	458	478	513	529	536
VI	186	140	169	247	370	466	486	520	537	545
VII	182	142	165	244	367	454	474	509	525	532
VIII	189	142	166	248	369	459	480	514	530	538

Road Construction

Region	1926	1932	1939	1945	1949	1955	1956	1958	1959	1960
US	**167**	**131**	**137**	**197**	**270**	**330**	**352**	**377**	**385**	**387**
I	173	134	140	206	287	342	363	388	394	397
II	168	133	141	202	283	344	367	394	401	405
III	168	132	142	205	286	346	368	395	402	405
IV	163	126	131	195	259	319	340	365	372	374
V	165	129	136	195	265	326	348	373	382	385
VI	164	129	132	190	253	317	337	360	368	370
VII	166	131	133	188	256	318	340	364	372	374
VIII	168	133	140	198	270	329	351	376	385	388

Ratio of RR Costs

	1930	Computed 1949	1953
	%	%	%
Road construction	68.75	68.40	66.66
Equipment, work	0.66	0.56	0.54
Equipment rolling & floating	23.03	24.47	26.38
General	7.56	6.57	6.42
Total	100.00	100.00	100.00

Road Construction by Accounts

	1926	1932	1939	1949	1958	1959	1960
Engineering	166	131	137	270	377	385	387
Other rt of way exp	159	121	135	258	324	332	337
Grading	153	106	90	139	159	160	160
Tunnels & subways	178	119	140	339	405	408	411
Brdg. culv & trestl	170	122	149	374	491	489	493
Elevated structures	165	129	149	382	539	530	531
Ties	173	144	158	302	381	396	396
Rails	144	140	136	245	414	426	423
Other track material	177	163	167	278	449	459	459
Ballast	175	146	143	254	348	355	369
Track laying & surf	188	164	165	366	543	569	569
Fences, snow sheds	178	147	141	279	395	398	399
Station & office bldgs.	184	141	166	368	515	531	539
Roadway buildings	187	140	162	386	520	538	546
Water stations	182	147	166	327	468	480	485
Fuel stations	180	144	159	357	503	520	528
Shops & eng houses	185	137	165	379	526	543	551
Grain elevators	190	137	164	367	520	538	549
Storage warehouses	189	137	166	377	532	550	558
Wharves & docks	177	136	153	350	464	480	485
Coal & ore, wharves	174	136	153	341	457	470	477
Tel & Tel lines	157	121	129	250	358	364	358
Sgnls & intrlocks	169	130	143	226	351	356	358
Power plants	186	138	167	386	552	571	579
Powr trnsmissn sys	176	143	148	266	410	422	425
Misc structures	186	141	161	378	527	545	553
Roadway mach	156	138	170	280	427	447	463
Roadway small tools	190	155	180	315	540	554	560
Public impr const	169	131	142	321	403	405	40
Shop mach	197	163	207	322	511	521	550
Power plant mach	165	138	178	242	397	405	410
Work equipment	180	165	200	348	530	544	553
							5

*** Ratio is per cent of accounts included in road construction to total of all accounts, at 1910–14 prices, computed in 1953. Indexes represent territorial index factors and are not for determining unit reproduction costs for individual roads.**

Handy-Whitman Cost Indexes for Public Utilities

Whitman, Requardt & Associates, Baltimore

Building (1911-14 = 100)

(Complete Index reports 14 Items)
A relates to Reinforced Concrete Bldg.; B relates to Brick Bldg.

	Jul '26	Jul '32	Jul '39	Jul '42	Jul '45	Jul '49	Jul '58	Jul '59	Jan '60	Jul '60	Jan '61	Jul '61
North Atlantic Division												
A	213	159	207	253	260	433	688	710	711	718	694	693
B	229	173	214	250	265	421	633	652	656	665	655	658
South Atlantic Division												
A	215	164	205	267	275	453	721	746	755	761	736	745
B	228	176	211	262	277	431	653	675	682	691	680	690
North Central Division												
A	201	154	200	242	253	418	673	698	697	707	677	679
B	211	164	203	234	250	390	612	634	635	645	631	636
South Central Division												
A	191	144	187	236	243	412	641	662	663	675	649	658
B	204	154	191	227	238	382	594	613	615	628	616	628
Plateau Division												
A	197	149	194	235	239	397	636	649	652	653	628	637
B	210	163	200	227	233	395	549	585	587	602	590	601
Pacific Division												
A	190	148	192	241	248	415	655	683	679	692	663	673
B	197	156	193	231	242	385	596	623	625	642	631	641

Gas Plant (1911 = 100)

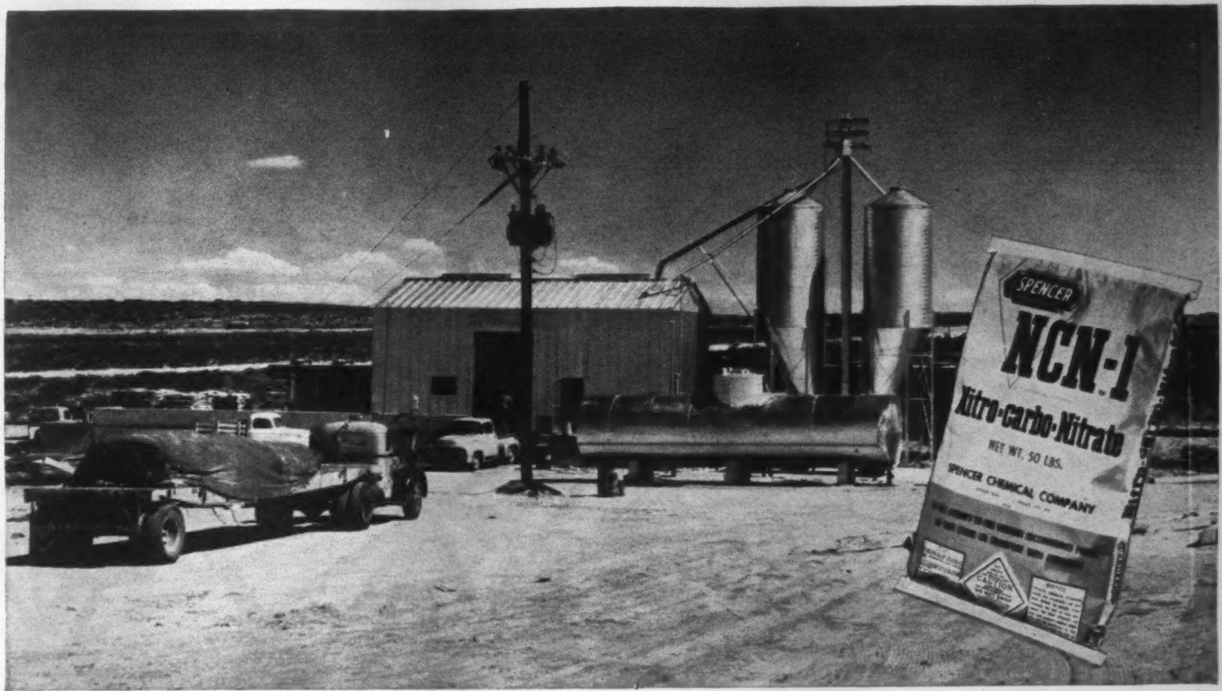
(Complete Index reports 25 Items)
A relates to Total Constr. & Equip.; B relates to Mech. Equip. Exclusive of Gas Holders.

	Ju '26	Jul '32	Jul '39	Jul '42	Jul '45	Jul '49	Jul '58	Jul '59	Jan '60	Jul '60	Jan '61	Jul '61
North Atlantic Division												
A	230	188	249	275	288	464	745	776	780	791	793	799
B	212	195	278	299	301	481	823	854	844	844	841	817
South Atlantic Division												
A	222	175	230	268	282	453	721	749	753	765	769	777
B	212	195	278	299	301	482	823	854	844	844	841	817
North Central Division												
A	218	178	232	254	269	434	694	719	721	731	732	739
B	212	195	278	299	301	481	823	854	844	844	841	817
South Central Division												
A	200	160	217	249	261	419	655	677	680	689	691	696
B	212	195	278	299	301	487	823	854	844	844	841	817
Plateau Division												
A	202	166	217	237	243	398	630	653	656	663	664	675
B	212	195	278	299	301	481	823	854	844	844	841	817
Pacific Division												
A	206	177	228	257	266	428	688	715	717	736	736	740
B	212	195	278	299	301	481	823	854	844	844	841	817

Electric Light & Power (1911 = 100)

(Complete Index reports 64 Items)
A relates to Total Constr. & Equip. All steam; B to Accessory Electric Equipment; C to Sub-Sta. Equip.

	Jul '26	Jul '32	Jul '39	Jul '42	Jul '45	Jul '49	Jul '58	Jul '59	Jan '60	Jul '60	Jan '61	Jul '61
North Atlantic Division												
A	194	176	225	248	259	400	627	641	635	641	631	622
B	196	186	224	239	237	341	543	548	517	518	451	431
C	178	168	203	216	218	312	484	487	471	475	456	426
South Atlantic Division												
A	201	180	233	267	273	422	667	685	677	683	673	664
B	203	191	240	262	248	356	564	576	545	543	477	461
C	183	173	218	237	228	325	506	515	499	500	481	455
North Central Division												
A	187	174	218	238	243	374	601	616	608	615	603	595
B	188	186	223	231	218	307	497	507	476	479	416	399
C	171	169	202	209	200	280	444	451	434	440	420	394
South Central Division												
A	183	171	218	246	251	390	617	629	621	629	618	609
B	189	190	230	248	235	340	539	547	516	519	452	434
C	171	173	209	226	217	311	476	482	466	471	451	423
Plateau Division												
A	188	171	219	236	241	378	604	623	614	618	608	604
B	196	188	232	236	225	323	509	526	494	496	431	417
C	177	171	211	212	207	294	453	467	450	454	434	411
Pacific Division												
A	178	163	215	242	244	380	608	625	618	630	621	611
B	177	170	222	240	225	323	520	537	508	516	452	434
C	161	155	202	219	208	297	473	487	473	483	462	435



First local supply center for Spencer pre-mixed ammonium nitrate blasting agent (NCN-1) is located at Carlsbad, New Mexico. Similar plants are proposed for other sections to fill local needs for low cost pre-mixed compounds of guaranteed uniform quality. Spencer NCN-1 Nitro-carbo-nitrate will be available in handy 50-pound bags.

Spencer announces NCN-1*

. . . another new service to lower blasting costs

More blasting efficiency for every dollar you spend! That's the promise of Spencer's far-ranging research program. This continuing program of investigation explores every new and better method of making blasting more efficient, safer, and less expensive.

Newest development in Spencer's program of maximum service to mining and construction users of blasting materials is an NCN-1 (Nitro-carbo-nitrate: pre-mixed ammonium nitrate blasting agent) plant in Carlsbad, New Mexico.

Designed to deliver NCN-1 by truck in handy 50-pound bags to the site where they are to be used, this new plant is the first of a network of producing depots that will provide local sources of supply to users in every part of the country.

Pre-mixing of the ammonium nitrate blasting agents provides a cleaner, easier to handle compound with more uniform blast output. Initially, the Carlsbad plant output has been established to meet current daily demands, but capacity expansion is planned to meet anticipated future increases in local usage.

And, of course, Spencer's NCN-1 is substantially less expensive than dynamite. But that's not all. Spencer's NCN-1 will provide 10% to 20% more blast energy than field compounded ammonium nitrate-fuel oil mixtures. That's accomplished through easier detonation resulting from the optimum density of the Spencer mixture and the special prill structure of Spencer's N-IV* ammonium nitrate which enables it to absorb fuel oil more evenly.

Spencer research has paid other use dividends to users of blasting materials. SPENITE*, Spencer's remarkably efficient boosting material, was made possible when Spencer investigators proved that in boosting ammonium nitrate-fuel oil mixtures, the heat generated was more important than the velocity of the detonator. As a result, SPENITE boosters provide 50% more explosive heat than any other commercial booster.

And Spencer research is responsible for the efficient Powder Monkey* pneumatic loading machine. 40 of these units currently in the field have proved that a two-man team using the Powder Monkey can outperform any other method of filling horizontal holes with blasting charges. It's another way Spencer makes blasting more efficient and at the same time, slashes costs to the bone.

For information on any of the advanced Spencer products for blasting, simply write to Spencer Chemical Company, Dwight Building, Kansas City, Missouri.

*Trademarks of Spencer Chemical Company

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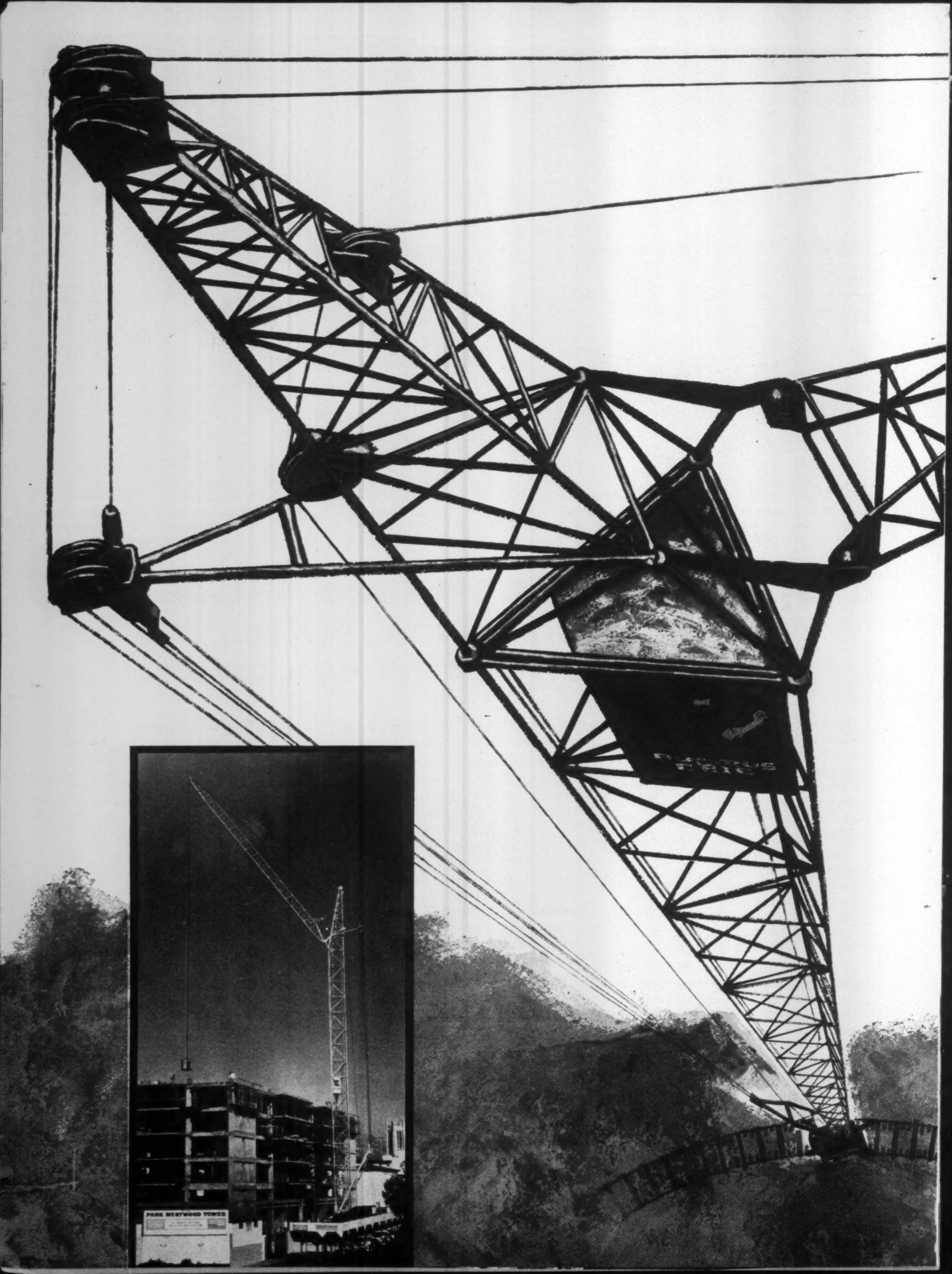
CIRCLE 71 ON READER SERVICE CARD

CIRCLE 73 ON READER SERVICE CARD →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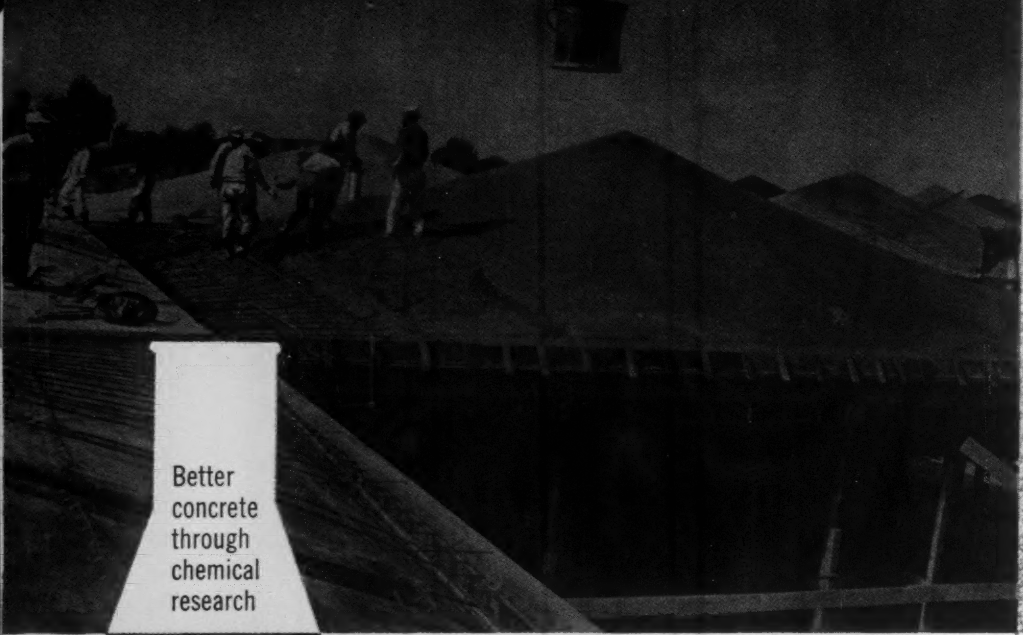

Better
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WRDA

WATER REDUCING ADMIXTURE

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G.E.M. SOUTHWAY DEPARTMENT STORE, ST. LOUIS

Just 85 days after the construction contract was let, this modern 236′ x 472′ St. Louis shopping center opened its doors for business.

Two short cuts in the roof construction pictured here helped substantially in meeting this tight-short construction schedule. The fifty hyperbolic roof paraboloids of reinforced concrete, each 47½′ square and 2½″ thick and supported by 24′ diameter columns were constructed in rows, using only five sets of forms that were re-used. As each successive row was finished, plasterers, masons and other trades stepped in and went to work.

Dewey and Almy's WRDA, water reducing admixture, and DARATARD, initial set retarder, provided the second short cut. Architects had estimated that a 7-sack plain mix would be needed to develop 2,500 p.s.i. in 48 hours. Dewey and Almy liquid admixtures enabled Vonder Haar Concrete Co. to design a mix developing 3,500 p.s.i. in 40 hours.

DAREX AEA, air entraining admixture, was also used in the concrete in accordance with job specs. As a net result, the 120,000 square foot roof was completed in just six weeks.

SPONSORS: G.E.M. International, Overland, Mo. and Lemay Building Corp. ARCHITECT: Manuel Morris, Kansas City, Mo. STRUCTURAL ENGINEER: Dutton Biggs, Kansas City, Mo. CONTRACTOR: Millstone Construction, Inc., St. Louis, Mo. READY MIX SUPPLIER: Vonder Haar Concrete Co., St. Louis, Mo. ADMIXTURE SALES AND TECHNICAL SERVICE: E. W. Zimmerman Construction Chemicals, Inc., Chicago, Ill.

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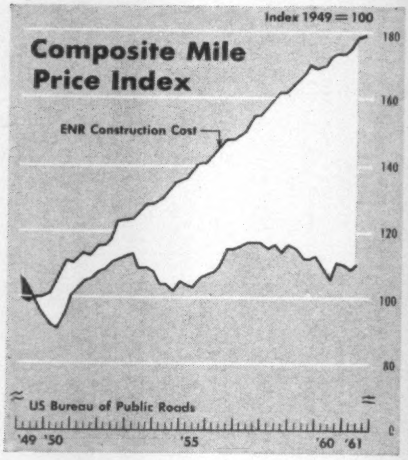
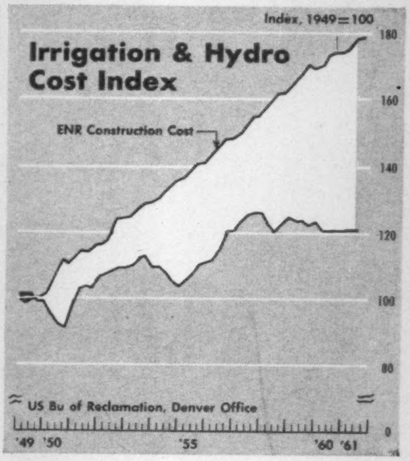




Highway bid prices moved higher during the second quarter, but not nearly enough to spring contractors from the cost-price vise they are caught in.

The increased volume of federal-aid highway work being let by state highway departments was reflected in an 0.8% rise in the U. S. Bureau of Public Roads Composite Mile Index. But this didn't regain the ground the index lost in the first quarter. And compared with last year's second quarter, the Composite Mile is only 0.6% higher, nowhere near the 2.9% increase in highway contractors' basic labor and material costs shown by ENR's Construction Cost Index. Whereas the Composite Mile in the second quarter was 6% under the late 1957 peak, ENR's Construction Cost Index was at a record high.

Seven out of ten quarterly bid price indexes compiled by state highway departments swung upward during the second quarter. Indexes rose 10% in California and New York, 4.7% in Colorado, 1% in Michigan, 1.5% in Oregon, 7% in Texas and 5% in Virginia.

Three of the ten state indexes skidded sharply lower in the second quarter: Idaho, off 30%; Nevada off 17.5%; and Washington down 20%. The depth of these declines reflected unusually high bid price indexes for this year's first quarter. Idaho and Washington both reported record high indexes in the first quarter, while Nevada's index struck a 3½-year high.

Irrigation and hydroelectric power construction continues as a major area where bid prices are sharply out of line with contractors' basic costs. Since April, while the ENR Construction Cost Index was hitting record highs, the U. S. Bureau of Reclamation's index of the construction "buyer's" cost of these jobs held absolutely steady.

Irrigation and Hydroelectric Cost Indexes

U.S. Bureau of Reclamation, Denver, Colo., 1949-51 = 1.0

	July						1961		
Class of Construction	1955	1956	1957	1958	1959	1960	Jan	Apr	Jul
Composite Index	**1.11**	**1.19**	**1.29**	**1.24**	**1.27**	**1.25**	**1.26**	**1.26**	**1.26**
Dams, earth	1.05	1.13	1.22	1.10	1.12	1.07	1.09	1.09	1.09
Dam structure	....	....	....	....	....	0.91	0.93	0.93	0.93
Spillway	....	....	....	....	....	1.23	1.24	1.24	1.24
Outlet works	....	....	....	....	....	1.35	1.36	1.36	1.36
Dams, concrete	1.02	1.09	1.15	1.12	1.13	1.12	1.12	1.12	1.12
Dams, diversion	....	....	....	....	....	1.39	1.39	1.39	1.39
Pumping plants, building & equip	1.26	1.37	1.46	1.42	1.48	1.46	1.44	1.42	1.42
Structure, rein conc, & improv	1.22	1.28	1.34	1.32	1.33	1.31	1.29	1.29	1.29
Equipment	1.30	1.45	1.58	1.60	1.67	1.71	1.67	1.65	1.65
Pumps & prime equipment	1.35	1.54	1.66	1.68	1.76	1.79	1.74	1.70	1.70
Accessory elec & misc equip	1.20	1.30	1.44	1.45	1.51	1.56	1.55	1.55	1.55
Steel penstocks, discharge pipes	....	1.53	1.72	1.63	1.75	1.78	1.78	1.78	1.78
Canals	1.05	1.13	1.21	1.13	1.12	1.11	1.11	1.10	1.10
Earthwork	....	....	....	....	....	1.06	1.07	1.05	1.05
Structures	....	....	....	....	....	1.16	1.16	1.15	1.15
Conduits (tunnels, conc-lined)	1.16	1.23	1.29	1.28	1.28	1.26	1.27	1.27	1.27
Laterals & drains	1.18	1.20	1.32	1.27	1.30	1.28	1.31	1.31	1.31
Earthwork	....	....	....	....	....	0.97	0.98	0.97	0.97
Structures	....	....	....	....	....	1.46	1.50	1.50	1.50
Power plants, hydro, bldg & equip	1.26	1.37	1.47	1.44	1.52	1.50	1.50	1.49	1.49
Structure, rein conc & improv	1.22	1.28	1.33	1.33	1.34	1.31	1.30	1.30	1.30
Equipment	1.28	1.44	1.55	1.58	1.63	1.63	1.62	1.60	1.60
Turbines & generators	1.31	1.46	1.58	1.60	1.67	1.65	1.65	1.63	1.63
Accessory electrical equip	1.24	1.34	1.48	1.49	1.53	1.56	1.50	1.48	1.48
Miscellaneous equipment	1.23	1.34	1.44	1.40	1.46	1.50	1.50	1.50	1.50
Concrete pipe lines	....	1.21	1.28	1.32	1.36	1.36	1.36	1.36	1.36
Switchyards & substations	1.38	1.47	1.60	1.56	1.63	1.65	1.58	1.58	1.58
Transmission lines—									
Wood-pole, 115-kv	1.02	1.09	1.10	1.21	1.23	1.28	1.27	1.27	1.27
Poles and fixtures	....	....	....	....	....	1.13	1.10	1.11	1.11
Overhead conductors, devices	....	....	....	....	....	1.39	1.40	1.40	1.40
Steel-tower, 230 kv	1.22	1.33	1.43	1.40	1.45	1.48	1.48	1.48	1.48
General property—buildings	1.20	1.29	1.31	1.32	1.38	1.41	1.40	1.40	1.40
Primary roads	1.12	1.16	1.25	1.21	1.25	1.25	1.24	1.24	1.24
Secondary roads (unsurfaced)	1.04	1.08	1.21	1.18	1.20	1.16	1.18	1.18	1.18
Bridges, steel	1.32	1.40	1.52	1.44	1.48	1.48	1.49	1.49	1.49

Based on combined costs of material and labor furnished by the contractor, and the government on US Bureau of Reclamation projects in 18 western states including Alaska

Highway Price Indexes in the U.S. and in 10 States

U.S.Bureau of Public Roads Prices & Indexes, 1925-29 = 100 ENR

	Excavation [1]		Surfacing [2]		Structures				Composite Mile Index	Construction Cost Index *b*
	Price	Index	Price	Index	Reinf. Steel Price	Struct. Steel Price	Struct. Concr. Price	Combined Index		
1925–29	**$0.35**	**100.0**	**$2.22**	**100.0**	**$0.052**	**$0.067**	**$22.15**	**100.0**	**100.0**	**100.0**
1959 Av	**0.38**	**109.1**	**3.99**	**179.9**	**0.127**	**0.184**	**53.42**	**246.5**	**164.6**	**385.07**
Q1	0.40	113.4	4.02	181.3	0.128	0.187	54.93	251.2	167.6	377.55c
Q2	0.37	104.8	4.03	181.7	0.125	0.182	51.90	240.7	163.1	383.84c
Q3	0.38	108.6	3.94	177.6	0.126	0.183	54.05	247.1	163.4	392.25c
Q4	0.38	109.4	3.97	179.0	0.130	0.184	52.80	246.9	164.4	390.36c
1960 Av	**0.38**	**108.1**	**3.88**	**174.9**	**0.122**	**0.174**	**52.15**	**238.3**	**160.6**	**397.95**
Q1	0.36	103.7	3.89	175.4	0.124	0.182	52.75	242.6	159.9	392.97c
Q2	0.37	105.7	3.89	175.4	0.122	0.170	50.30	233.1	159.1	399.51c
Q3	0.39	110.3	3.92	176.7	0.121	0.175	53.11	240.4	162.6	401.51*c*
Q4	0.40	112.5	3.82	172.2	0.120	0.168	52.43	237.1	160.7	401.36*c*
1961										
Q1	0.38	108.3	3.79	170.9	0.121	0.170	52.63	238.1	158.7	403.07*c*
Q2	0.38	107.7	3.84	173.1	0.120	0.170	54.03	241.0	160.0	410.91*c*

State Highway Indexes

Base Year =100	California 1940	Colorado 1949	Idaho 1950	Michigan 1940	Nevada 1955	New York 1940	Oregon 1940	Texas '49–'53	Virginia '37–'41	Washington 1940
1959 Av	**239.7**	**93.0**	*a*	**163.7**	**104.6**	**230.3**	**172.2**	**112.2**	**220.5**	**194.0**
Q1	216.1	97.2	108.9	163.0	110.0	246.7	201.4	117.0	212.4	189.0
Q2	270.4	92.5	88.4	164.1	102.4	226.8	165.4	112.1	201.1	194.6
Q3	260.3	89.3	77.5	163.8	105.7	229.6	165.4	108.4	276.7	196.9
Q4	229.1	93.0	99.6	163.2	106.2	217.9	172.8	112.0	217.0	195.4
1960 Av	**232.5**	**90.3**	*a*	**175.1**	**112.4**	**237.3**	**175.4**	**110.4**	**206.7**	**212.0**
Q1	219.8	88.1	103.8	170.8	101.2	246.3	167.3	110.9	214.6	192.8
Q2	251.6	92.8	103.6	174.5	111.0	244.3	182.7	106.0	224.2	190.1
Q3	229.1	92.3	102.7	183.8	115.6	226.3	176.4	114.6	196.9	210.7
Q4	228.5	89.3	136.8	171.1	93.5	242.2	175.5	111.5	226.5	212.0
1961										
Q1	229.6	99.7	145.3	169.3	125.9	211.1	175.2	116.0	209.1	242.9
Q2	252.8	104.6	101.6	171.2	103.9	231.6	177.9	124.3	219.7	195.0

Weightings used in BPR Composite Mile Index are: excavation, 17,491 cy (other than common excavation expressed as equivalent of common); surfacing, 3,726 sy (other than Portland cement concrete expressed as equivalent of Portland cement concrete); reinforcing steel, 16,000 lb; structural steel, 4,325 lb; structural concrete, 68 cy. The index is based on average unit prices on Federal aid highway projects let by states. •a Official yearly average not released. •b Converted to 1925–29 = 100 base. •c Last month of quarter.

←CIRCLE 74 ON READER SERVICE CARD

Materials Prices Monthly Market Quotations by ENR Field Reporters

See following ENR issues for OTHER PRICES:

- Clay Products, Lime, Plaster, Paint, Roofing: Last, Aug. 31; Next, Sep. 28.
- Wage Rates, Building Board, Lath, Insulation: Last, Aug. 31; Next, Sep. 28.
- Cement aggregate, Ready-Mixed Concrete, Asphalt: Last, Sep. 7; Next, Oct. 5.
- Iron & Steel Products Pipe: Last, Sep. 14; Next, Oct. 12.

LUMBER, TIMBER, PLYWOOD— + or — denote this price is higher or lower than last month's price

Item	Unit	Atlanta	Balti-more	Birming-ham	Boston	Chicago	Cin-cinnati	Cleve-land	Dallas	Denver
LUMBER, TIMBER										
1x6s4s .... Pine	Mbf.	81.00	+90.00	+75.00	......	+104.00	91.00	93.00	−105.00	......
Fir		....	+96.00	−97.00	......	101.00	92.00	......	......	......
1x8s4s .... Pine	"	+84.00	+90.00	+78.00	......	+107.00	93.00	97.00	−105.00	......
Fir		....	+96.00	−92.50	103.00	−103.00	94.00	......	......	......
2x4s4s .... Pine	"	+81.00	+90.00	−82.00	100.00	−106.00	98.00	+107.00	107.50	......
Fir		....	+111.00	−115.00	110.00	110.00	110.00	+113.00	99.25	99.50
2x6s4s .... Pine	"	+82.00	+92.00	−80.00	100.00	−106.00	98.00	99.00	107.50	......
Fir		....	+111.00	−114.00	110.00	110.00	110.00	−107.00	99.25	98.50
2x8s4s .... Pine	"	+84.00	+93.00	−82.00	100.00	+113.00	98.00	104.00	123.50	......
Fir		....	+116.00	−114.00	110.00	+113.00	110.00	109.00	......	97.50
2x10s4s .... Pine	"	+89.00	+95.00	−88.00	115.00	115.00	105.00	110.00	123.50	......
Fir		....	+116.00	−117.00	120.00	+118.00	115.00	−111.00	......	100.50
3x12Rgh .... Pine	"	+104.00	132.50d	−100.00	......	125.00	112.50	......	137.50	......
Fir		....	132.00d	−128.00	......	−125.00	130.00	130.00	......	116.50
6x12Rgh .... Pine	"	+114.00	132.50d	−100.00	......	135.00	135.00	......	171.00	......
Fir		....	132.50d	−130.00	......	+128.00	130.00	130.00	......	114.50
12x12Rgh .... Pine	"	+129.00	133.50d	−115.00	......	135.00	135.00	......	178.00	......
Fir		....	132.00d	−128.50	......	+128.00	130.00	130.00	......	107.50
FIR PLYWOOD (a)										
⅝" Int. Plyscored, CD gr.	Msf.	125.00	+129.00	−126.71	−116.90	135.00	130.45	−120.00	+125.00	110.25
¾" Exterior Plyform, BB gr.	"	215.00	+220.50	−209.71	−211.46	225.00	214.70	215.00	+212.50	210.00

Item	Detroit	Kansas City	Los Angeles	Minne-apolis	New Orleans	New York	Phila-delphia	Pitts-burgh	St. Louis	San Fran-cisco	Seattle	Montreal	Toronto
LUMBER, TIMBER													
1x6s4s .... Pine	+108.00	110.00	......	......	83.00	−90.00b	......	−82.00	+88.00	......	....	79.00c	+90.00c
Fir	−96.00	110.00	+78.50	−82.25	−95.75	−97.00	......	−96.00	−91.00	−76.00	60.00	......	......
1x8s4s .... Pine	+110.00	110.00	......	......	85.00	−92.00	......	−82.00	+90.00	......	....	81.00c	+93.00c
Fir	−98.00	110.00	72.50	−86.25	−95.75	−99.00	......	−82.00	−91.00	−76.00	65.00	......	......
2x4s4s .... Pine	+104.00	105.00	......	......	95.00	−93.00b	−95.00b	−82.00	+98.00	......	....	79.00c	+90.00c
Fir	−107.00	110.00	−82.50	−100.50	−105.75	−98.00	−105.00	−112.00	+103.00	−84.00	73.00	......	108.00
2x6s4s .... Pine	−104.00	110.00	......	......	90.00	−93.00b	96.00b	−84.00	+98.00	......	....	79.00c	+84.00c
Fir	−101.00	115.00	−81.50	−99.50	−105.75	−98.00	+105.00	−112.00	−101.00	−84.00	73.00	......	107.00
2x8s4s .... Pine	−114.00	110.00	......	......	90.00	−93.00b	−97.75b	−89.00	+101.00	......	....	95.00c	+91.00c
Fir	−110.50	115.00	83.50	−103.25	−106.50	−98.00	−107.75	−112.00	+104.00	−84.00	73.00	......	−112.00
2x10s4s .... Pine	−118.00	120.00	......	......	105.00	−89.00b	−98.50b	−91.00	−102.00	......	....	125.00c	+91.00c
Fir	118.00	120.00	83.50	−108.75	−111.25	−101.00	−107.50	−114.00	−108.00	−84.00	75.00	......	−112.00
3x12Rgh .... Pine	......	......	......	......	120.00	−111.00b	......	−116.00	−110.00	......	....	......	+105.00c
Fir	181.00	140.00	91.00	+112.50	136.75	−118.00	−126.75	−130.00	125.00	−90.00	87.50	......	123.00
6x12Rgh .... Pine	......	......	......	......	......	−111.00b	......	−116.00	−115.00	......	....	120.00c	......
Fir	181.00	......	91.00	120.50	−123.75	−118.00	−122.75	−130.00	−125.00	−111.00	91.00	......	127.00
12x12Rgh .... Pine	....	140.00	......	......	117.00	−116.00b	......	−116.00	−115.00	......	....	120.00c	......
Fir	181.00	140.00	91.00	−114.50	−120.75	−123.00	+126.75	−123.00	−125.00	−112.00	91.00	......	−125.00
FIR PLYWOOD (a)													
⅝" Int. Plyscored, CD gr.	+120.00	130.00	95.80	117.00	122.25	−122.20	−114.90	−122.50	−115.37	−96.00	94.00	119.25	145.00e
¾" Exterior Plyform, BB gr.	+214.20	215.00	+155.10	208.05	201.95	−212.60	−202.15	−212.60	205.93	−179.00	180.00	225.95	+230.00

Fir-Random length, 75% construction grade, 25% standard grade, 30,000 bf, green stock, grademarked. Pine-Random length, #2 common and better. Southern Pine Inspection Bureau grademarked, 30,000 bf. Lumber prices include freight from mill to city and cost of unloading and trucking full carlot to jobsite. •a Certificated stock, carlots, fob city. •b Hemlock, 75% construction grade, 25% standard grade. •c Spruce. Fir plywood prices, per Msf. fob Northwest mill: CD grade interior sheathing—½" $78-80, ⅝" $88-90; BB grade Plyform—⅝" $152-155, ¾" $172-175. •d Nominal. •e Exterior.

WINDOW GLASS, Discounts from Jobber's list, Feb. 1, 1950 (a) sales tax extra—single or double strength

	Atlanta	Balti-more	Birming-ham	Boston	Chicago	Cin-cinnati	Cleve-land	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minne-apolis	New Orleans	New York	Phila-delphia	Pitts-burgh	St. Louis	San Fran-cisco	Seattle	Montreal	Toronto
A quality	78%	74%b	82%c	70+10%eg	70%	72%	72-2-10%	70%	73%-10	72-10-10%	76-10-10%	$12.88/17.32	70-10%	76%d	79%	80%	76%	74-10-10%ef	60%	$8.85/11.55di	40-10-5%a	$6.49/9.50
B quality	80%d	74%b	83%c	70+10%eg	70%	72%	72-2-10%	70%	73%-10	72-10-10%	76-10-10%	$10.45/14.13	70.10%	76%d	79%	80%	76%	74-10-10%e1	73%	6.41/8.07di	40-10-5%a	5.90/8.77

Glass: •a Jobber's list price per box, 14 x 20, ss. $42.75 for A quality, $37.50 for B quality; 14 x 20, ds. $60.00 for A quality, $52.75 for B quality. •b sales tax extra. •c 77% for single strength. •d From 6/15/52 list. •e 77% for double strength. •f Single strength; double strength, 83%. •g From 8/1/58 list. •h ss/ds, 40-in. •i 20 boxes min. •l eff. 10/15/58. •m less 2% disc, 10 days. •n less 1% disc, 10 days. •o add 2% sales tax. •p less 1% for cash. •q less 2% for cash.

EXPLOSIVES per lb, 40% Ammonia Gelatin in 50 lb cases delivered in 500 lb lots (non-seismograph grades)

Urban Areas	Atlanta	Balti-more	Birming-ham	Boston	Chicago	Cin-cinnati	Cleve-land	Dallas	Denver	Detroit	Kansas City	Los Angeles	Minne-apolis	New Orleans	New York	Phila-delphia	Pitts-burgh	St. Louis	San Fran-cisco	Seattle	Montreal	Toronto
	$0.2595	$0.2795	$0.2595	$0.2795	$0.2795	$0.2595	$0.2595	$0.2870	$0.2795	$0.2795	$0.2795	$0.2795	$0.2795	$0.2795	$0.5130g	$0.2795	$0.2595	$0.2795	$0.2795	$0.2795	$23.20h	....

Explosives: Cartridges of 1¼" diameter or over, in standard lengths. •g deliveries in certain areas must be by truck or by truck and boat, requiring extra charge. •h fob Beloeil (near Montreal), per 100 lb., lots under 2000#, wood cases, forcite, 40%. Forcite 60% $24.30 in fiber cases; forcite 40%, $24.05; forcite 60%, $25.80. Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40% in U. S., $1.75 per 100 lbs. higher in Canada.

Non-Urban Areas	C/L 30,000 lb. lots	10,000 lb. lots	2,000 lb. lots	200 lb. lots
Group 1*	$0.21.95	$0.22.95	$0.26.45	$0.27.95
Group 2†	.22.70	.23.70	.27.20	.28.70

*All areas except those in Group 2 and N.J. cities of Bayonne, Hoboken, Jersey City, No. Bergen, Union City and Weehawken † Florida counties of Manatee, Hardee, Highlands, Okeechobee, St. Lucie and south thereof; Idaho; Maine; Montana; New Mexico counties of Catron, Socorro, Lincoln, De Baca, Roosevelt and south thereof; Texas counties of Bailey, Lamb, Hale, Floyd, Motley, Cottle, Hardeman, Foard, Knox, Haskell, Jones, Taylor, Coleman, McCulloch, San Saba, Burnet, Williamson, Milan Robertson, Leon, Houston, Angelina, Nacogdoches, Shelby and south thereof.

PILES prices per linear foot, fob cars, New York

Dimensions	Points	Length	By Rail— Pine*§	Fir	Dimensions	Points	Length	By Rail— Pine*§	Fir
12" at butt	6-in.	30 to 39-ft.	$0.42a	....	14"—2-ft. from butt ...	6-in.	65 to 69-ft.	1.21	....
12"—2-ft. from butt	6-in.	40 to 44-ft.	.91	....	14"—2-ft. from butt ...	6-in.	70 to 74-ft.	1.34	$1.40
12"—2-ft. from butt	6-in.	45 to 49-ft.	.97	....	14"—2-ft. from butt ...	6-in.	75 to 79-ft.	1.41	1.40
12"—2-ft. from butt	6-in.	50 to 54-ft.	1.01	....	14"—2-ft. from butt ...	5-in.	80 to 84-ft.	1.54	1.45
12"—2-ft. from butt	6-in.	55 to 59-ft.	1.07	....	14"—2-ft. from butt ...	5-in.	85 to 89-ft.	1.67	1.54

* Pine piling over 90 feet available only in limited quantities. § ASTM Class B •a, trucked in from N. J. Prices per linear foot, fir and pine, rough peeled, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine under fifty feet based on freight from mid/South, over fifty feet, on freight from deep south.

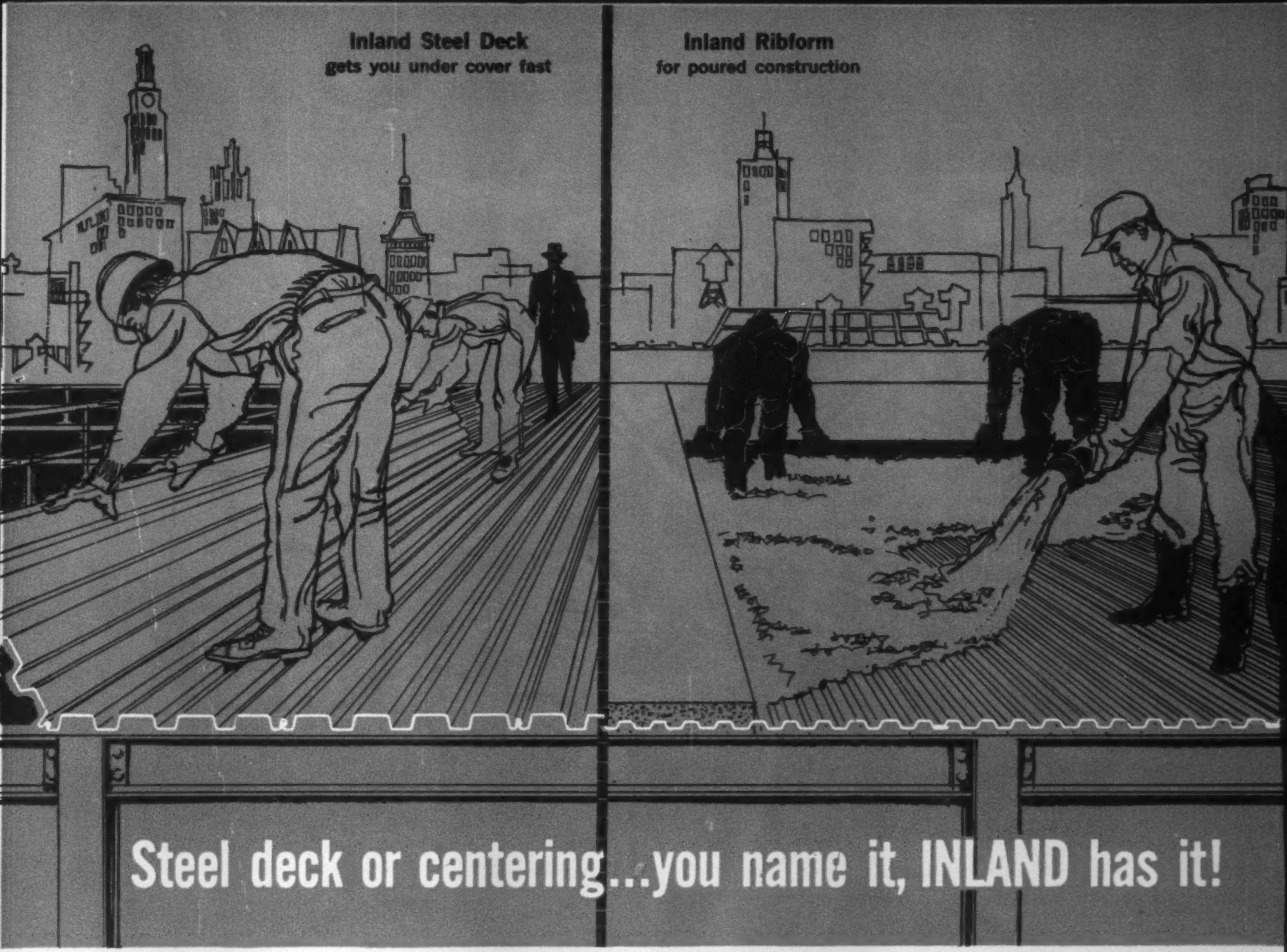
RAILWAY TIES

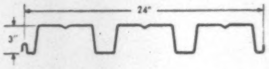
Prices f.o.b. per tie box carload lots:		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 8" x 8'6" Untr.	7" x 8" x 8'6" Tr.
Birmingham*	Hardwood, Grade 3	$1.70	$2.55	Gr. 5 $2.25	$3.33
	Grade 2	1.50	2.35	" 4 2.10	3.18
	Grade 1	1.15	2.00	" 3a 1.70	2.78
Chicago	Red Oak	2.85-3.00	4.00a-4.10	3.90	4.75
New York	Mixed Hardwood	3.45	5.10	4.30	6.50
	Mixed Oak	3.55	5.20	4.40	6.60
Philadelphia	Mixed Oak	3.80	3.97	4.37	4.65-4.75
St. Louis	Mixed Oak	2.65h	3.75h	3.05h	4.10h
San Francisco	Douglas Fir	2.15e	3.45e	2.50ef	3.50ca

Tr.—Treated; Untr.—Untreated. •a Creosoted. •c Empty cell. •e Green •f f.o.b. cars. •g 7 x 9 x 8'6" * Add 75¢/tie freight charge to Birmingham. •h 7" x 9" x 8½. •i Mixed Hardwood

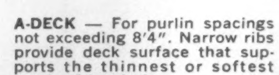
CHEMICALS Water, sewage treatment, road work, carlots, f.o.b. works

Chlorine cylinders, liquid, per lb. freight allowed, N. Y. State	$ .11
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, ton	32.00
Silicate of soda, 52 deg., in drums, per 100 lb.	2.65
Soda ash, 58%, in paper bags, per 100 lb. dense	1.90
Sulphate of aluminum, commercial, in 100-lb. bags	2.05
Sulphate of copper in bags, 99% per 100 lb., reg., 25.2% copper content	12.50

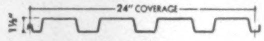

Inland Steel Deck
gets you under cover fast
Inland Ribform
for poured construction
Steel deck or centering...you name it, INLAND has it!



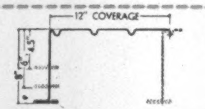
NEW! N-DECK — Available in lengths from 6′0″ to 28′6″. Carries normal roof loads over spans up to 16′0″. Especially practical for canopies.



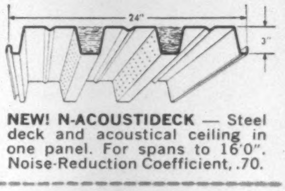
A-DECK — For purlin spacings not exceeding 8′4″. Narrow ribs provide deck surface that supports the thinnest or softest types of insulation.



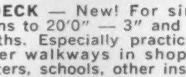
B-DECK — For spans to 10′0″. Wide rib distributes metal for greater structural efficiency. Well suited for use as side wall panels.



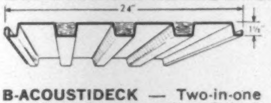
T-STEEL—New! Galvanized only. For clear spans to 32′0″. Adaptable to acoustical and flush, luminous ceiling treatments. Provides superior diaphragm to resist seismic and wind loads.



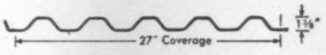
NEW! N-ACOUSTIDECK — Steel deck and acoustical ceiling in one panel. For spans to 16′0″. Noise-Reduction Coefficient, .70.



H-DECK — New! For simple spans to 20′0″ — 3″ and 4½″ depths. Especially practical to cover walkways in shopping centers, schools, other installations. Also available in Acoustideck.



B-ACOUSTIDECK — Two-in-one panel combines steel roof deck with acoustical ceiling having Noise-Reduction Coefficient of .70. Used for spans to 10′0″,



RIBFORM — High-tensile, galvanized steel form for concrete slabs over spans up to 8′0″. Three types: Standard, Heavy-Duty, Super-Duty (shown).

Expansion projects and new buildings get under cover fast and economically, when you specify an Inland roof system.

Inland steel deck is easy to handle and weld in place — in any weather that a man can work. Effects of construction abuse are held to a minimum, since types A, B, C, and H decks are Bonderized, then covered with a baked-enamel primer that resists on-the-job damage. One field coat of paint over this is usually enough.

In concrete-over-steel construction, Inland Ribform supports wet concrete with minimum deflection. Rigid sheets are quickly and inexpensively attached to supports — in place, they provide a safe work platform for crews.

Write for catalog 248—see Sweet's section 2i/Inl. For help on unusual problems, you can draw on the diversified experience of Inland sales engineers. Write or call your nearest Inland office.

member of the
INLAND
steel family

ENGINEERED PRODUCTS DIVISION

INLAND STEEL
PRODUCTS COMPANY
Dept. I, 4147 West Burnham Street
Milwaukee 1, Wisconsin

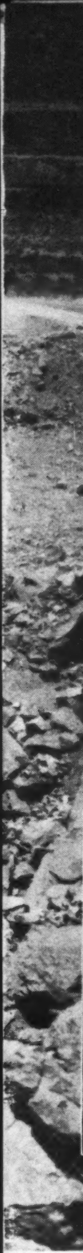
EP-5A

ATLANTA, BALTIMORE, BUFFALO, CHICAGO, CINCINNATI, CLEVELAND, DALLAS, DENVER, DETROIT, HOUSTON, KANSAS CITY, LOS ANGELES, MILWAUKEE, MINNEAPOLIS, NEW ORLEANS, NEW YORK, ST. LOUIS

NORTH WEST
AMSCO

Amsco makes dippers as original equipment for most leading power shovels. Other power shovel accessories include dipper lips, fronts and doors, racks, bevel gears, crawler shoes sheaves, sprockets, idlers, shipper shaft pinions.

Amsco manganese steel, "The toughest steel known," is used in this gyratory crusher mantle and concaves. In some cases, new Amsco manganese moly alloys can result in more time between crusher shutdowns. Ask your manufacturer about these special alloys.



WHERE WEAR IS A PROBLEM

look to AMSCO for the answer

Building wear resistant parts for your machinery can be handled in one of two ways.

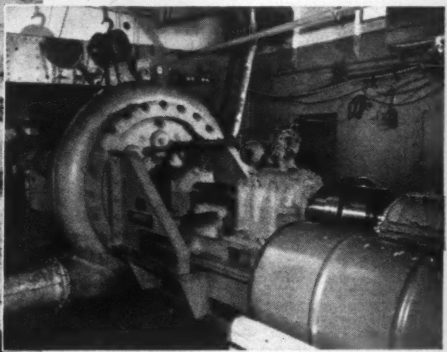
First, parts can be "beefed up" to make them heavier and larger.

Second, superior metallurgy can be applied to make parts tougher and stronger without increasing weight.

A "beefed up" part will probably last longer simply because there is more metal to wear away. But, consider a jaw crusher. Heavier, larger parts impose strains that bearings and framing members were not designed to take. A heavier jaw means a restricted opening that actually *cuts* production.

Amsco works with original equipment builders to design parts that make the entire machine operate as it was designed to do. In addition to manganese steel (12-14% manganese), special alloys have been developed to meet your specific needs, such as, chrome-moly steels, multiple alloy engineering steels and high chromium and nickel iron.

Your nearby Amsco representative or your equipment dealer will analyze your operation and recommend an Amsco alloy product that will produce or move material at the lowest operating cost per ton. Amsco products pay for themselves through reductions in replacement and maintenance.



Amsco dredge pumps aren't "sold off the shelf." Each one is custom engineered to a specific application to make certain it will give the longest, most trouble-free life for the conditions it will encounter. Dredge pump accessories include swing sheaves, cutterheads, flap valves, elbows, hose nipples and hand hole nipples for every condition of impact and abrasion.

Simplex* two-part reversible dipper teeth stay sharp after competitive teeth have *worn out completely*. Reversing for extra life takes only a few minutes. Simplex design plus a new dipper tooth alloy is saving dipper tooth replacement costs wherever shovels are used. Try replacing half your dipper teeth with Simplex and measure the difference under your own job conditions.

Fast build-up, repair and hardfacing are features of Amsco electrodes and weldments. Send for your sample kit containing our famous "Pair for Wear"—Nicro Mang* for all manganese welding or replacing a buttering pass of stainless when welding manganese steel to carbon steel and X-53 for all-purpose hardfacing. These two rods handle 90% of build-up and hardfacing jobs.

*TRADEMARK REGISTERED

They're backed by experience...

AMERICAN
Brake Shoe
COMPANY

Other plants in:
Denver • Los Angeles • New Castle, Delaware
Oakland, California • St. Louis
IN CANADA: Joliette Steel and Manitoba Steel Foundry Divisions
IN MEXICO: Amsco Mexicana, S.A.
Welding products distributed in Canada by Canadian Liquid Air Co., Ltd.

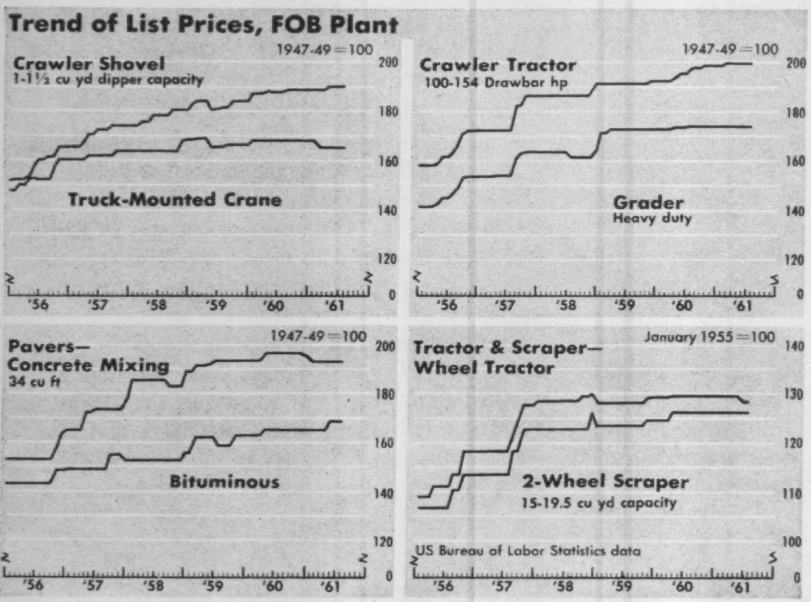
AMSCO

AMERICAN MANGANESE STEEL DIVISION
CHICAGO HEIGHTS, ILLINOIS

CIRCLE 79 ON READER SERVICE CARD

1161

Basic Cost Factors: A Look



Trend of List Prices, FOB Plant

MACHINES: List Prices Ease

After five consecutive months of record highs, the U. S. Bureau of Labor Statistics Index of construction equipment list prices dipped.

Its June value, 178.2, is a shade under the all-time May peak of 178.5.

The July index, latest available as we go to press, is the same as June. The index is based on equipment manufacturers' average list prices in 1947-49 as 100.

Compared with July '60, the over-all Bureau of Labor Statistics index is 1.5% higher. List price boosts of 9%-10% are the largest 12-month gains registered by any of the items covered by the index.

Other big gainers since last July are cable-control dozers up 7%, hydraulic-control dozers 8% higher and contractors' air tools and rippers and rooters up 5%.

Equipment List Price Indexes

U.S. Bureau of Labor Statistics, 1947-49=100

	July 15 1961	July 15 1960	July 15 1959	% Change (July, '60-July, '61)
All Types of Equipment	178.2	175.5	172.0	+1.5
Cranes, Draglines, Shovels	173.4	173.4	168.6	0
Shovel, ½ cy	173.1	167.9	163.3	+3.1
Shovel, ¾ cy	178.8	175.4	172.5	+1.9
Shovel, 1-1½ cy	191.0	188.2	181.9	+1.5
Shovel, 2-2½ cy	169.1	170.3	162.1	−0.7
Shovel 3-3½ cy	159.8	167.8	167.8	−4.8
Shovel, 6 cy	197.9	197.9	190.5	0
Crane, truck mounted	165.9	168.2	165.7	−2.4
Crane, tractor mounted	135.1	135.1	135.1	0
Bucket, clam shell	162.9	162.9	157.5	0
Bucket, dragline	169.3	169.3	169.3	0
Scrapers and Graders	165.7	166.6	165.7	−0.5
Scraper,				
4-wheel, 8-10.5 cy	145.3	155.0	155.0	−6.3
4-wheel, 12-15 cy	153.3	156.8	156.8	−2.2
2-wheel, 15-19.5 cy (a)	126.2	126.2	123.7	0
Grader, heavy duty	174.1	174.0	172.6	+0.1
Grader, light medium	170.9	171.1	171.1	−0.1
Tractors (non-farm)	195.1	192.0	187.8	+1.6
Wheel-type, off-hwy (a)	127.6	129.2	128.2	−1.3
Crawler under 49 dhp	200.4	194.0	188.8	+3.3
50-74 dhp	205.3	200.4	191.9	+2.4
75-99 dhp	204.8	201.2	196.4	+1.8
100-154 dhp	200.2	197.3	191.3	+1.5
155-200 dhp	208.6	203.3	201.3	+2.6
Machinery, Tractor Mtd	177.9	169.5	168.6	+5.0
Dozer, cable control	164.8	154.4	154.4	+6.7
Dozer, hydraulic control	201.4	186.6	186.6	+7.9
Cable power control unit	148.8	152.9	151.4	−2.7
Loader, shovel type	166.7	163.2	161.5	+2.1
Specialized Machinery	159.6	158.7	155.7	+0.1
Ditcher	153.8	153.8	156.6	0
Roller, tandem	228.5	226.4	209.8	+0.9
Roller, 3 wheels	178.7	178.7	174.9	0
Ripper and rooter	164.5	156.6	150.5	+5.1
Dewaterg pump, 10 Mgph	108.5	111.5	110.0	−2.7
Dewaterg pump, 90 Mgph	156.1	151.5	150.5	+3.0
Portable Air Compressors	183.6	167.5	167.5	+9.6
Capacity, under 200 cfm	189.2	173.2	173.2	+9.2
Capacity, over 200 cfm	178.6	162.4	162.4	+10.0
Contractors Air Tools	190.5	181.6	181.6	+4.9
Mixers, Pavers, Spreaders	161.6	161.8	156.1	−0.1
Mixer, portable, 11 cf	169.6	166.8	165.0	+1.7
Mixer, portable, 16 cf	175.8	172.7	169.8	+1.8
Mixer, truck, 6 cy	131.1	135.1	132.4	−3.0
Mixer, Paving, 34 cf	192.9	196.7	193.5	−1.9
Concrete finisher, & spdr.	198.4	201.9	190.4	−1.7
Bituminous distributor	124.5	126.2	122.3	−1.3
Bituminous spreader	179.4	179.4	170.2	0
Bituminous paver	168.6	165.6	159.3	+1.8
Off-Highway Vehicles (b)	102.3	102.5	101.1	−0.2
truck (b)	102.0	102.0	101.1	0
Trailer dump wagon (b)	104.5	106.7	101.4	−2.1

(a) January 1955=100 (b) January 1958=100

MONEY: Still Higher Rates Coming

President Kennedy must now realize that it was easier to convince voters that he could "nudge" rates down than to convince Federal Reserve Board Chairman Martin to put his heart into the "nudging".

ENR's second quarterly cost review pointed out that the Administration's fight for cheaper long-term money was lost. Since then, Treasury bond yields have climbed steadily to an August average of 4.01%. As a result, corporations and public works agencies have found it more expensive to borrow (see table) and it may get still more expensive. With strong money demand from the reviving and rearming economy and Treasury financing looming there just isn't much of a case for lower rates.

Watch for the Fed to drop all pretense of cooperating with the Administration's money-easing ideas if steel prices rise.

Borrowing Cost Trends

Long-Term Bonds*

(Per cent yield to maturity)

Year	US Treas. %	Municipal %	Industrial %	Public Utility %	Railroad %
1929	3.60	4.27	5.04	4.96	4.67
1931	3.34	4.01	4.79	4.57	4.42
1939	2.41	2.76	2.64	2.83	3.39
1945	2.34	1.67	2.50	2.59	2.75
1946	2.19	1.64	2.44	2.50	2.59
1949	2.28	2.21	2.53	2.69	2.71
1957	3.47	3.60	3.80	3.99	3.94
1958	3.23	3.56	3.65	3.86	3.89
1959	4.10	3.95	4.25	4.49	4.41
1960: Aver	3.99	3.73	4.26	4.51	4.46
Sep	3.72	3.53	4.09	4.35	4.29
Oct	3.85	3.59	4.15	4.43	4.32
Nov	3.88	3.46	4.18	4.48	4.35
Dec	3.87	3.45	4.23	4.52	4.37
1961: Jan	3.87	3.44	4.16	4.47	4.35
Feb	3.78	3.33	4.12	4.40	4.31
Mar	3.76	3.38	4.07	4.35	4.25
Apr	3.79	3.44	4.13	4.43	4.26
May	3.72	3.38	4.15	4.44	4.31
June	3.89	3.53	4.23	4.49	4.42
July	3.90	3.53	4.26	4.51	4.49
Aug	4.01	3.55	4.29	4.53	4.56

Short-Term Business Loans#

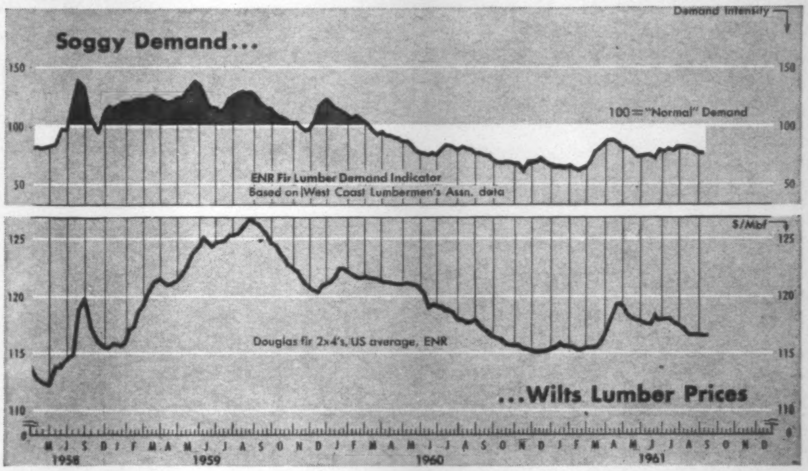
Year	New York City %	7 Other Northern & Eastern Cities %	11 Southern & Western Cities %
1929 Aver.	5.76	5.82	5.93
1931 Aver.	3.82	4.26	4.90
1939 Aver.	2.15	3.05	3.62
1945 Aver.	2.20	2.55	2.80
1946 Aver.	1.84	2.51	2.97
1949 Aver.	2.35	2.86	3.17
1957 Aver.	4.23	4.39	4.65
1958 Aver.	4.12	4.34	4.67
1959 Aver.	4.84	5.01	5.23
1960 Aver.	4.97	5.15	5.45
1958: Jun	3.88	4.17	4.58
Sep	4.00	4.21	4.54
Dec	4.29	4.50	4.79
1959: Jun	4.71	4.90	5.07
Sep	5.15	5.27	5.44
Dec	5.19	5.39	5.56
1960: Mar	5.18	5.34	5.57
Jun	5.19	5.34	5.58
Sep	4.74	4.96	5.32
Dec	4.77	4.97	5.33
1961: Mar	4.75	4.96	5.29
June	4.75	4.95	5.31

* Standard & Poor's data: Taxable Treasury bonds (Federal Reserve Bd. series on partially tax exempt bonds shown for years 1929-39 had 1945 value of 1.66%); high grade municipal bonds; A1+grade industrial, utility and railroad bonds.

Federal Reserve Board data for June. New Series 1949 to date; two former series cover up to 1938 and 1939-48 and are not strictly comparable.

Costs Roundup—3rd Quarter

at the 4 'M's



MATERIALS: Lumber Prices Break

Construction men got good news from ENR's Lumber Demand Indicator in the third quarter (chart above). This barometer of the demand-supply picture at West Coast lumber mills coasted slowly lower during the summer and so did lumber prices. "Normal" demand is signalled by an indicator reading of 100. As we go to press, the indicator is at 78.

Almost the full responsibility for the lumber demand slump goes to homebuilding. There was good demand from non-residential construction. But this in itself is not enough to support today's huge volume of lumber production. Lumbermen who counted on the second quarter's perked-up housing starts to expand in the summer were jolted when starts turned down in July.

No one seriously expects housing demand and lumber prices to improve much in what's left of '61. Norton Clapp, president of Weyerhaeuser Co., the nation's top lumber producer feels that a full price "correction does not seem to be in prospect because of the seasonal fall-off in home building and other construction during the fall and winter months."

Mr. Clapp looks for higher lumber prices in '62. Whether or not he is right, contractors face higher prices for another basic material, **cement.**

After a year of absorbing higher wage costs and paying higher federal income taxes under a reduced raw material depletion allowance, three major producers, Alpha Portland Cement Co., Ideal Cement Co. and Permanente Cement Co. have scheduled '62 price hikes ranging from 10¢ to 15¢ per bbl for bulk and up to 25¢ per bbl for bagged cement. And Marquette Cement Manufacturing Co. indicates that it will schedule "moderate" 1962 price hikes for some sections of the country by the end of this month. Other big manufacturers are making noises that leave little reason to hope that they will fail to join the higher price parade if they can.

But that's a big "if" in some parts of the country, where stiff price competition from foreign cement has been a factor for years, the New England area for example. However, a manufacturer operating in that market tells ENR that recent government actions against the "dumping" of imports in the northeastern United States have eased the price pressure from overseas cement.

The year's biggest price question, whether steel prices will go up when wages rise this fall, is more complicated than ever. The steelmakers not only have to worry about stepped-up competition from other materials and imported steel if they boost prices, they now must consider the effect of a price hike on John F. Kennedy. The President has point-blank "asked" the steel industry to hold the price line. And, in a move which may tip the scales against higher prices this year, he virtually promised that he would be in the steel companies' corner when new contract talks begin next spring.

It's reasonable to expect steel prices to stay where they are until the first of the year. But on any jobs up for bid after that it would be smart to figure on more expensive steel.

For a detailed analysis of the fourth "M", Manpower, see pp. 56-57

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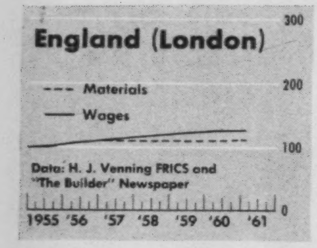
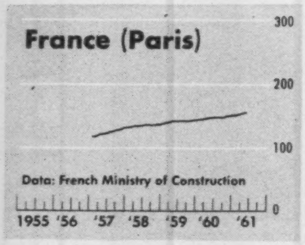
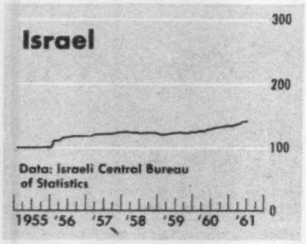
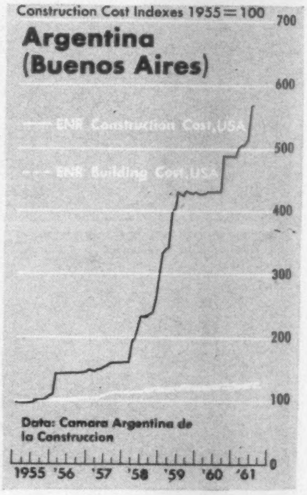
Close Up on Prices and Wages

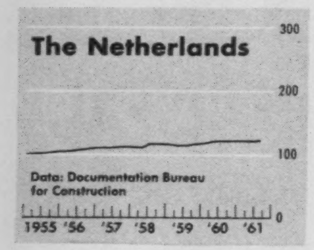
Construction Cost Indexes 1955=100

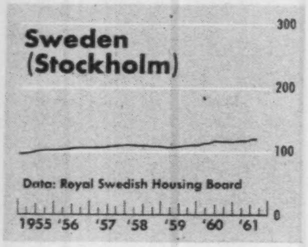


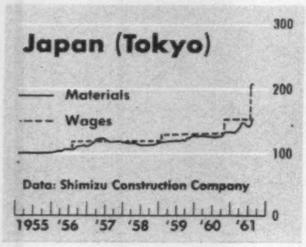












Europe . . .

	London (England)		Paris (France)		Milan (Italy)		Amsterdam (The Netherlands)		Bonn (West Germany)		Madrid (Spain)		Stockholm (Sweden)	
	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961
Currency Unit:	Pound Sterling		Franc G		Lire		Florin		Deutschemark G		Peseta		Kronor	
MATERIALS: fob city														
Structural Steel Shapes	43/10/0*A*	44/0/0*A*	8,587.00*B*	8,720.00*B*	7,100– 7,700*F*	7,300– 7,800*F*	500.00*B*	486.50*B*	470.00*B*	470.00*B*	8.00*E*	7.70*E*	709.00*B*	703.00*B*
Reinforcing Steel Bars	42/0/0*A*	42/5/0*A*	7,779.00*B*	7,808.00*B*	5,900– 6,300*F*	7,100– 7,300*F*	493.50*B*	458.50*B*	480.00*B*	480.00*B*	7.50*E*	7.25*E*	823.00*B*	776.00*B*
Portland Cement	5/10/0*A*	5/15/3*A*	1,011.40*B*	1,018.70*B*	925– 1,075*FG*	1,000– 1,200*FG*	59.25*B*	59.00*B*	74.50B	74.50*B*	900.00*B*	800.00*B*	4.82*H*	4.92*H*
Lumber: 1st Class Pine 2"x4"	115/0/0– 140/0/0*a*	115/0/0– 140/0/0*a*	4,265.70*Cb*	4,444.40*Cb*	52,000– 54,000*Cc*	53,000– 55,000*Cc*	......	......	265.00*Cd*	275.00*Cd*	3,500.00*Cf*	3,500.00*Cf*	......	....
2nd Class Pine 2"x4"	94/0/0– 98/0/0*a*	94/0/0– 98/0/0*a*	3,089.90*Cb*	3,110.50*Cb*	47,000– 50,000*Cc*	50,000– 52,000*Cc*	......	......	245.00*Cd*	250.00*Cd*	2,500.00*Cf*	2,800.00*Cf*	......	....
Other (see footnotes)	....	....	....	....	....	....	219.50*C*	223.50*C*	220.00*Ce*	225.00*Ce*	....	....	1.24*g*	1.30*g*
Gravel	1/3/8*D*	1/5/5*D*	301.10*C*	303.70*C*	500–650*C*	650–750*C*	8.21*B*	8.26*B*	7.00*C*	8.25*C*	130.00*C*	110.00*C*	10.40*B*	10.90*B*
Sand	1/6/9*D*	1/6/9*D*	288.40*C*	292.20*C*	900–1050*C*	950–1050*C*	5.59*B*	5.59*B*	9.50*C*	11.50*C*	90.00*C*	120.00*C*	9.25*B*	9.75*B*
LABOR: per hour														
Common Labor:														
Heavy Construction	0/4/4*b*	0/4/4½*d*	27.27	29.20	426.42	430.16	3.00	3.01	3.53	3.77	74.88*a*	77.00*a*	9.15	9.65
Building Construction	0/4/4*b*	0/4/4½*d*	27.27	29.20	426.42	430.16	3.00	3.01	3.68	3.92	74.88*a*	77.00*a*	8.30	8.75
Skilled Labor:														
Bricklayers	0/4/11½*b*	0/5/0*d*	46.86	50.40	537.86	542.48	3.00	3.01	4.01	4.25	105.56*a*	110.00*a*	9.90	10.45
Carpenters	0/4/11½*b*	0/5/0*d*	41.37	44.50	539.74	544.35	3.02	3.03	4.01	4.25	105.56*a*	110.00*a*	9.70	10.05
Structural Ironworkers	0/4/9½*b*	0/4/10*d*	43.83	47.20	537.86	542.48	2.60	2.88	3.85	4.08	313.56*ac*	300.00*ac*	......	....
VALUE IN U. S. CURRENCY														
Official exchange rate	$2.80	$2.80	$0.2025	$0.2025	$0.00161	$0.00161	$0.2639	$0.2639	$0.2398	$0.2510	$0.0167	$0.0167	$0.1938	$0.1938
Free market rate	....	....	....	....	$0.00161	$0.00162	....	....	$0.2398	....	$0.0167	$0.0167	$0.1938	$0.1938

•A per long ton (2,240 lbs •B per metric ton (2,204.6 lbs) •C per cu meter •D per cu yd •E per kilo •F per 100 kilo (220.462 lbs) •G delivered to jobsite •H per 100 kilos (110.231 lbs.). LUMBER: •a per standard (165 cu ft) •b Vosges lumber •c fir lumber •d pine lumber 8x10 cm (3.15"x3.94") •e Fichtenkantholz lumber (3rd class pine) 8x10 cm •f Balsain lumber •g per linear meter. LABOR: •a per 8 hr day •b add 0/8/3 social charges wk •c add food and travel allowance on distant jobs •d add 0/10/7 social charges wk

Asia . . .

	Bombay (India)		Colombo (Ceylon)		Karachi (Pakistan)		Tokyo (Japan)		Manila (Philippines)	
	1960	1961	1960	1961	1980	1961	1960	1961	1960	1961
Currency Unit	Rupee		Rupee G		Rupee		Yen G		Yen	
MATERIALS: fob city										
Structural Steel Shapes	705.00*A*	705.00*A*	925.00*A*	1,000.00*A*	1,400.00*Al*	1,200.00*Al*	45,000*B*	47,000*B*	800–900*B*	800–900*B*
Reinforcing Steel Bars	695.00*A*	695.00*A*	875.00*A*	925.00*A*	798.00*AH*	850.00*AH*	36,000*B*	38,000*B*	470–600*B*	549–600*B*
Portland Cement	131.29*Al*	124.00*Al*	225.00*A*	225.00*A*	75.10*AHb*	88.00*AHb*	6,600*B*	6,100*B*	3.15–3.50*a*	2.90–3.30*a*
Lumber: 1st Class Pine 2" x 4"	8.00*D*	12.00–13.00*D*	....	....	16.00*D*	16.00*D*	15,840*C*	23,000*C*	....	....
2nd Class Pine 2" x 4"	6.00*D*	10.00–12.00*D*	....	....	15.00*D*	15.00*D*	14,400*C*	21,000*C*	....	....
Other (see footnotes)	20.00*DA*	19.00–21.00*Da*	23.00*D*	22.00*Dd*	12.00*Db*	12.00*Db*	....	....	200–220*Fc*	270–320*Fc*
Gravel	32.00–43.00*EJ*	49.00–65.00*EJ*	18.00*A*	18.00*A*	55.00*E*	55.00*E*	1,450*Cb*	1,750*Cb*	5.00–5.50*C*	6.00*C*
Sand	42.00*EKB*	45.00–50.00*EKb*	7.00*Aa*	8.50*Aa*	24.00*E*	25.00*E*	970*Cc*	1,300*Cc*	4.00–4.50*C*	5.00*C*
LABOR: per hour										
Common Labor:										
Heavy Construction	3.00*a*	3.50*a*	0.7225*b*	0.7225*b*	0.375	0.375	680*a*	1,000*a*	0.5175	0.5175
Building Construction	2.50*a*	2.75*a*	0.7225*b*	0.7225*b*	0.313	0.313	600*a*	900*a*	0.5175	0.5175
Skilled Labor:										
Bricklayers	6.75*a*	6.50*a*	0.7975*b*	0.7975*b*	0.875	0.875	900*a*	1,200*a*	0.776–1.294	0.776–1.294
Carpenters	7.00*a*	8.00*a*	0.7975*b*	0.7975*b*	1.10	1.10	800*a*	1,200*a*	0.776–1.294	0.776–1.294
Structural Ironworkers	6.00*a*	6.00*a*	0.7975*b*	0.7975*b*	0.875	0.875	900*a*	1,400*a*	0.776–1.294	0.776–1.294
VALUE IN U. S. CURRENCY										
Official exchange rate	$0.209	$0.209	$0.211	$0.211	$0.210	$0.211	$0.0028	$0.0028	$0.500	$0.333
Free market rate	....	....	$0.211	$0.211	$0.154	$0.143	....	....	$0.263	$0.263

A per long ton (2,240 lbs) •B per metric ton (2,204.6 lbs) •C per cubic meter •D per cu ft •E per 100 cu ft •F per Mfbm •G delivered to jobsite •H ex Karachi mill •I ex warehouse •J ex quarry •K ex dock CEMENT: •a per 94 lb sack •*b* includes 10% sales tax. LUMBER: •a teak lumber •*b* deodar lumber •*c* Red Luan Lumber •*d* Jak wood. LABOR: •a per 8 hr day •*b* includes dearness allowance GRAVEL: •a ¼"-¾" •*b* 25 mm •SAND: •a river sand •*b* washed •*c* coarse

Around the World

Costs Roundup—3rd Quarter

Construction men operating outside the U. S. had one blessing not enjoyed by stateside contractors this year. In several major construction centers, wages were stable or actually lower than last year. And where wages did rise, the increases were somewhat smaller than in the '59-'60 period.

The Near and Far East had particularly good results in holding down wage costs.

Wage rates for common labor and the three "key" skilled trades (bricklayers, carpenters and structural ironworkers) are mostly unchanged from last year in seven major African and Near-Eastern cities. In a couple of these cities rates for some trades are actually lower than last year. Wages rose in three other cities in this explosive area. But in one of the three (Ankara, Turkey) the increases were offset by a sharp currency devaluation.

Wages are also pretty stable in the Far East this year. Common and skilled labor rates are the same as last year in Colombo, Karachi, Manila and Melbourne.

In Bombay, wages for laborers, carpenters and structural ironworkers are higher than in 1960, but bricklayers rates are down 3%. In Tokyo, however, all wages rose sharply this year.

European building and construction workers generally drew higher pay this year. Rates are up in all of the seven major European cities covered by ENR's survey, even in Madrid, where government policies have tended to hold back wage increases. On the whole, however, the wage boosts are not too heavy. In London and Amsterdam, for example, the increases can be measured in fractions.

Stable wages in a few Latin American countries will make life easier for contractors planning to ride the tide of new construction business which the $20-billion Alliance for Progress will bring to the lands south of the border. But in other countries, such as Brazil and Argentina, wages continue to squeeze contractors hard.

Construction workers wages are unchanged or lower in Mexico City, Caracas and Bogota, but up in Lima and San Juan. Rates are sharply higher in Brasilia. And in Buenos Aires, huge increases again skyrocketed costs (see chart).

Africa and the Near East . . .

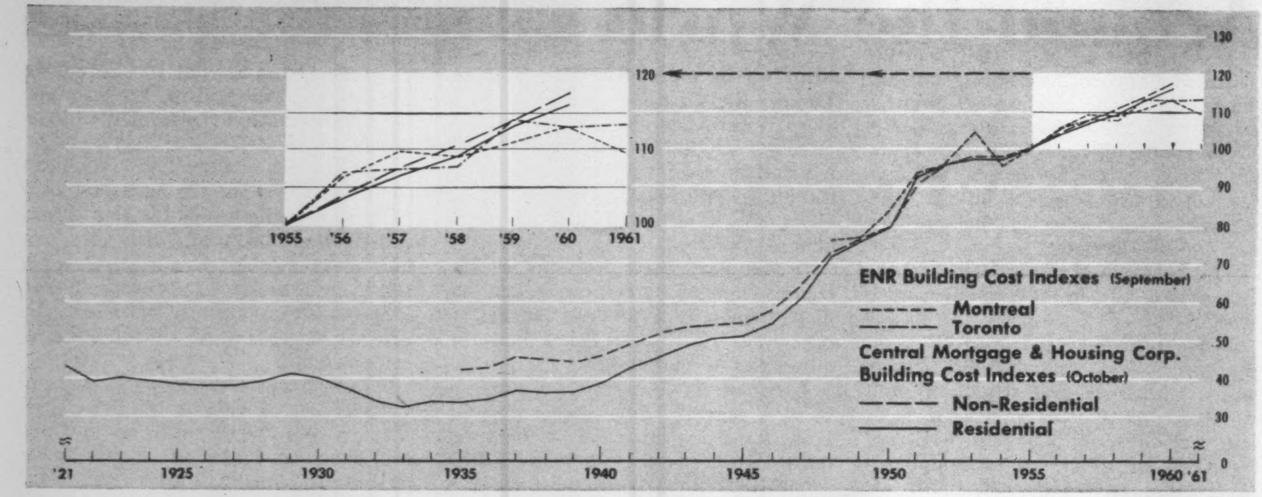
	Casablanca (Morocco)		Cairo (U.A.R.)		Tel Aviv (Israel)		Baghdad (Iraq)		Beirut (Lebanon)		Ankara (Turkey)		Kuwait	
	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961
Currency Unit	Moroccan Franc		Egyptian Pound		Israeli Pound		Dinar D		Lebanese Pound		Turkish Lira		Rupee	
MATERIALS: fob city														
Structural Steel Shapes	69,400.00B	76,000.00B	75.00–95.00B	75.00–95.00	470.00B	437.00B	110.00B	110.00B	550.00B	520.00B	1,600.00BE	1,740.00BE	1,410.00B	1,500.00B
Reinforcing Steel Bars	74,300.00B	67,250.00B	54.00–79.00B	60.00–85.00	410.00B	395.00B	53.00B	50.00B	375.00B	360.00B	1,750.00BE	1,760.00BE	705.00B	625.00B
Portland Cement	8,955.00A	8,955.00A	5.50B	5.50	88.50B	97.50B	7.50B	7.50B	58.00B	57.50B	130.00BE	140.00BE	110.00C	110.00C
Lumber:														
1st Class Pine 2"x4"	35,000.00C	38,500.00C	36.00Ca	39.50Ca	....	278.75C	105.00Cc	105.00Cc	225.00C	220.00C	750.00CD	650.00CD	1,400.00C	1,400.00C
2nd Class Pine 2"x4"	35.000.00C	38,500.00C	33.50Ca	37.00Ca	275.00Ca	268.79C	....	....	175.00C	180.00C	600.00CD	550.00CD	....	....
Other (See footnotes)	31,475.00C	31,475.00C	....	....	250.00C	268.75C	31.50Cb	28.50Cb	....	....	....	....	420.00Cb	400.00Cb
Gravel	1,100.00Ca	1,045.00Ca	75.00Cb	75.00Cb	5.14C	3.61C	1.00Ca	1.00–1.25Ca	7.50C	6.00C	....	6.90CF	15.00C	26.00C
Sand	450.00Cb	500.00Cb	30.00Cb	30.00Cb	2.20C	2.06C	1.00Cb	1.00Cb	5.00Ca	4.50Ca	....	6.90CF	10.00Cb	15.00Cb
LABOR: per hour														
Common Labor:														
Heavy Construction	102.50	110.00	0.20a	0.20a	8.62ae	9.57ae	0.800a	0.800a	8.00c	8.00c	10.80	15.00bd	12.00a	12.00a
Building Construction	114.30	123.00	0.20a	0.25a	8.785ae	9.57ae	0.800a	0.800a	6.00c	6.00c	....	9.20bd	12.00a	12.00a
Skilled Labor:														
Bricklayers	175.20	189.90	0.80a	0.80a	10.315af	12.03ah	2.20a	2.20a	12.00c	12.00c	21.60	24.00bd	43.00a	38.00a
Carpenters	214.30	230.40	0.70a	0.70a	10.315af	12.03ah	2.20a	2.20a	12.00c	10.00–12.00c	21.60	24.00bd	36.00a	36.00a
Structural Ironworkers	246.30	262.90	0.80a	0.80a	10.315af	12.03ah	2.30a	2.30a	15.00c	15.00c	21.60	24.00bd	33.00–43.00a	37.00–40.00a
VALUE IN U. S. CURRENCY:														
Official exchange rate	$0.00198	$0.00198	$2.874	$2.874	$0.556	$0.556	$2.849	$2.849	....	....	$0.3571	$0.1106	$0.2083	$0.2083
Free market rate	$0.00185	$0.00179	$2.062	$2.000	$0.556	$0.556	$2.703	$2.703	$0.3145	$0.3279	$0.0769G	$0.0769G	$0.1515	$0.1515

•A per long ton (2,240 lbs) •B per metric ton (2,04.6 lbs) •C per cubic meter •D delivered to jobsite •E fob plant •F fob quarry •G black market LUMBER: •A swedish pine •b local whitewood •c hardwood GRAVEL: •a 15-25mm •b graded first quality •c 1" SAND: •a washed •b coarse LABOR: •a per 8 hr day •b per 8½ hr day •c per 10 hr day •d included 4% social charges paid by employer and 4% paid by government •e plus 0.585 cost of living increase •f plus 0.700 cost of living increase •g plus 0.93 cost of living increase •h plus 1.17 cost of living increase •i plus 23% Social Charges

Latin America . . .

	San Juan (Puerto Rico)		Mexico City (Mexico)		Caracas (Venezuela)		Bogota (Colombia)		Lima (Peru)		Sao Paulo (Brazil)		Brasilia (Brazil)		Buenos Aires (Argentina)	
	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961	1960	1961
Currency Unit	U. S. Dollar		Peso		Bolivar		Peso		Sole		Cruziero		Cruziero		Peso	
MATERIALS: fob city																
Structural Steel	10.00A	10.00A	2,700.00Bac	2,116.35Bac	700.00–1,000.00Bb	700.00–1,000.00Bb	1,350.00Bd	1,160.00Bd	5.95E	5.65E	33.00E	41.00E	....	45.00E	18,500.00B	19,330.00B
Reinforcing Steel	6.75A	6.85A	2,050.00BE	1,800.00–2,000.00BG	490.00–545.00Bc	490.00–540.00Bc	965.00Bd	1,100.00Bd	5.10E	4.85E	26.20E	46.50E	25.10Ea	45.00E	14,500.00B	15,040.00B
Portland Cement	1.05Ab	1.05Ab	245.00B	250.00–270.00B	1.07B	1.07B	130.00Bd	129.00Bd	23.68a	23.68a	256.00a	378.50a	315.00D	430.00D	2,420.00B	2,780.00B
Lumber: 2" x 4".																
1st Class Pine	150.00F	150.00F	2,900.00–3,400.00eg	2,300.00–2,800.00eg	290.00C	280.00C	....	....	5.20g	5.20g	6.20ab	11.50ab	....	....	188.00mf	172.00mf
2nd Class Pine	120.00F	115.00F	2,400.00–2,500.00eg	2,000.00–2,200.00eg	280.00C	265.00C	....	....	4.70g	4.80g	......	......	....	....	146.00lf	143.00lf
Other	....	....	....	....	290.00Ci	265.00Ci	14.00fj	19.00fj	4.00gh	5.00gh	......	......	35.00ad	50.00ad	195.00kf	177.00ff
Gravel	4.25Cd	4.30Cd	30.00CaG	30.00CaG	12.00Ce	12.00Ce	33.00cf	22.50Cf	28.00Cc	32.00Cc	650.00	1,500.00	1,150.00Cb	1,100.00Cb	620.00C	600.00C
Sand	2.05Cb	2.12Cb	33.00CaG	30.00CaG	15.00Cb	14.00Cb	20.50Cd	23.00Cd	28.00Cc	32.00Cc	350.00	580.00	850.00Cc	1,000.00Cc	150.00Cb	150.00Cl
LABOR: per hour																
Common Labor:																
Heavy Constr.	0.85	0.96	101.50bc	101.50bc	15.17ac	15.17ac	12.00a	7.50a	59.52a	65.10a	31.85	47.20	28.00	44.80	282.01a	409.10a
Building	0.83	0.95	136.50bc	136.50bc	15.17ac	15.17ac	9.00a	7.50a	59.52a	65.10a	31.85	47.20	28.00	44.80	282.01a	409.10a
Skilled Labor:																
Bricklayers	1.34	1.45	210.00bc	210.00bc	25.67ac	25.67ac	10.00a	10.31a	84.68a	93.75a	67.60	60.00	42.00	77.20	376.02a	565.06a
Carpenters	1.34	1.45	245.00bc	245.00bc	25.67ac	25.67ac	12.75a	13.50a	84.68a	93.75a	50.70	70.00	42.00	77.20	376.02a	565.06a
Iron-workers	1.37	1.51	315.00bc	315.00bc	25.67ac	25.67ac	12.75	15.70a	120.76a	150.00a	......	70.00	....	....	376.02a	565.06a
VALUE U. S. CURRENCY																
Official exchange	$1.00	$1.00	$0.080	$0.080	$0.300	$0.300	$0.146	$0.149	$0.0364	$0.0373	$0.0535	$0.0535	$0.0535	$0.0535	....	....
Free market rate	....	....	....	....	$0.300	$0.218	$0.147	$0.119	$0.0364	$0.0373	$0.00541	$0.00395	$0.00541	$0.00541	$0.0122	$0.0121

•A per 100 lbs •B per metric ton (2,204.6 lbs) •C per cu meter •D per 50 kilo sack •E per kilo (2,2046 lbs) •F per Mfbm •G delivered to jobsite STRUCTURAL STEEL SHAPES •a delivered from Monterey to jobsite •b second price cut to size "c ,,I" beams, 3" x 3" x 4' •d fob Bogota warehouse REINFORCING STEEL BARS •a ½" •b corrugated rods, ⅜" x ½" x 11 meters or ¾" x 1" x 11 meters •c ⅝"–1½" •d fob Bogota warehouse CEMENT: •a 42 kilo sack •b bagged •d fob plant add 3.00 pesos for jobsite delivery LUMBER •a per linear meter •b 1" x 2" •c 3rd class pine 1" x 12" unsized •d 3rd class pine 3" x 3" unsized •e per 1,000 sq ft •f per sq meter •g per board foot •h cedar lumber •i Saquisaqui lumber •j pino real •k Brazilian pine lumber 2" x 12" 3rd class •l 3rd class pine 1" x 6" •m 3rd class pine 3" x 4" GRAVEL: •a blue •b #1 •c ¼" •d ½" •e crushed rock •f add 21.00 pesos for jobsite delivery SAND: •a blue •b washed •c coarse •d add 22.50 pesos for jobsite delivery LABOR: •a per 8 hr day •b per week •c extra day's pay for six days work



Canadian Costs: Stability in 1961

Stable wages and materials prices in Canada are keeping building and construction costs in line.

Construction workers' contracts in Montreal and Toronto ran out in May. And as we go to press, only common laborers in Toronto have reached new agreements. They got a five-cent-an-hour increase. Work is proceeding during negotiations.

Lumber prices are lower in both of these cities this year. Cement is slightly lower in Montreal. Prices of other major materials are the same as in 1960.

American firms involved in Canadian construction are able to stretch their budgets because of lower exchange rates on the Canadian dollar.

Prices and Wages

	Montreal 1959	Montreal 1960	Montreal 1961	Toronto 1959	Toronto 1960	Toronto 1961
Currency Unit: Canadian Dollar						
MATERIALS:						
Structural Steel Shapes	$8.50–8.63	$8.50–8.63	....	$9.20	$9.20	$9.20
Reinforcing Steel Bars	7.00–7.50	7.00–7.50	$7.00–7.50	7.85	7.85	7.25
Portland Cement	3.11	3.11	2.96	3.84	3.84	3.84
Lumber: Spruce 2"x4"	84.00	84.00	79.00	98.00	88.00	85.00
Douglas fir 2"x4"	....	....	....	......	......	108.00
Gravel	2.15	2.15	2.15	2.40	2.40	2.40
Sand	2.40	2.40	2.40	2.05	2.05	2.05
LABOR:						
Common Labor:						
Heavy Construction	1.59	1.79	1.79	1.87	2.08	2.08
Building Construction	1.59	1.79	1.79	1.87	2.08	2.08
Skilled Labor:						
Bricklayers	2.40	2.61	2.61	3.12	3.28	3.33
Carpenters	2.20	2.40	2.40	2.91	3.02	3.07
Structural Ironworkers	2.30	2.61	2.61	2.96	3.17	3.17
VALUE IN U. S. CURRENCY:						
Official exchange rate	......	......	......	......	......	......
Free market rate	$1.041	$1.015	$1.014	$1.041	$1.015	$1.014

Prices are fob City. Wages are per hour and include fringe benefits. All data reported to ENR as of June 1, 1961. •A per cwt. •B per bbl. •C per Mbf •D 75% construction grade, 25% standard grade •E per ton •F ¾"

Building Trades Wage Rates by City

Dominion Department of Labor and Canadian Construction Assocociation July 1 Rates

	BRICKLAYERS				CARPENTERS				ELECTRICIANS				PAINTERS			
City	1939	1949	1960	1961	1939	1949	1960	1961	1939	1949	1960	1961	1939	1949	1960	1961
Halifax a	$1.00	$1.44	$2.29	$2.29	$0.70	$1.23	$2.02	2.02	$0.85	$1.33	$2.26	2.26	$0.60	$1.07	$1.76	1.76
Saint John	0.90	1.45	2.10	2.10	0.50–0.60	1.10	1.87	1.87	0.50–0.65	1.10	2.00	2.00	0.50–0.55	1.00	1.65	1.65
Quebec	0.75–0.85	1.30	2.13	2.18	0.55 0.60	1.10	1.93	1.98	0.55–0.65	1.10	2.00	2.05	0.50–0.55	1.05	1.83	1.88
Montreal	0.80–0.90	1.40–1.75	2.55	2.55	0.70	1.25	2.35	2.35	0.75	1.35	2.45	2.45	0.66	1.15	2.25	2.25
Ottawa	....	1.65	2.60	2.60	....	1.30	2.35	2.35	....	1.50	2.52*hf*	2.70*c*	....	1.00	1.75	1.90
Toronto	1.00	1.80	3.15	3.20	0.90	1.60	2.90	2.95	1.00	1.75	3.47*e*	3.60*g*	0.75	1.35	2.51	2.61
Hamilton	0.90	1.70	2.95	2.95	0.75	1.50	2.85	2.85	0.75	1.55	3.20*i*	3.35	0.65	1.20	2.30	2.30
Windsor	1.15	1.75	2.88	2.88	0.95	1.60	2.70	2.70	1.15	1.75	3.00*c*	3.00*c*	0.60–0.65	1.25–1.35	2.13	2.13
Winnipeg	1.10	1.60	2.60*c*	2.60	0.85	1.40	2.50	2.50	0.85	1.40	2.75	2.80	0.70	1.20	2.20	2.20
Regina	....	1.70	2.56	2.56	....	1.45	2.25	2.25	....	1.50	2.46*d*	2.46*d*	....	1.20	2.05	2.05
Edmonton	1.10	1.80	2.80	2.90	0.90	1.47½	2.55	2.60	0.85	1.60	2.85	2.85	0.80	1.25	2.00	2.00
Vancouver	1.10	1.80	2.99	2.99	0.75–0.90	1.60	2.92	2.92	0.75–1.00	1.70	3.22*b*	3.26	0.63–0.80	1.40	2.84	2.84

	PLASTERERS				PLUMBERS				SHEETMETAL WORKERS				LABORERS			
City	1939	1949	1960	1961	1939	1949	1960	1961	1939	1949	1960	1961	1939	1949	1960	1961
Halifax a	$0.80	$1.35	$2.25*h*	2.50	$0.85	$1.30	$2.21	2.21	$0.70	$1.13	$1.91	1.91	0.30–0.40	$0.81	$1.45	1.45
Saint John	0.90	1.45	2.10	2.10	0.60–0.70	1.25	2.00	2.00	0.50–0.65	1.20	1.55	1.55	0.30–0.40	0.65	1.10	1.10
Quebec	0.75	1.30	2.13	2.18	0.55–0.65	1.10	2.00	2.05	0.55–0.65	1.10	1.93	1.98	0.40	0.75	1.53	1.58
Montreal	0.80	1.40–1.50	2.65	2.65	0.75	1.55	2.62	2.62	0.65–0.75	1.25	2.35	2.35	0.40	0.80	1.75	1.75
Ottawa	....	1.50	2.25	2.35	....	1.60	2.80	2.80	....	1.47	2.60	2.75	....	0.70	1.50	1.50
Toronto	0.90	1.90	3.20	3.20	1.00	1.75	3.35*e*	3.47*e*	0.93	1.75	3.25*c*	3.42*c*	0.35–0.50	0.95	2.00	2.00
Hamilton	0.90	1.70	2.90*b*	2.90	0.85	1.60	2.90	3.10	0.75	1.55	2.95*c*	2.95*c*	0.35–0.45	1.85	1.85	1.85
Windsor	0.90	1.65	2.88	2.88	1.00	1.75	3.10	3.10	0.70–0.85	1.60	3.00	3.00	0.55	1.10	2.06	2.06
Winnipeg	1.10	1.60	2.70	2.70	0.95	1.55	2.80	2.80	0.70	1.10	2.40	2.40	0.40–0.45	0.75–0.85	1.65	1.65
Regina	....	1.65	2.40	2.45	....	1.55	2.50	2.55	....	1.35	2.34	2.40	....	0.75	1.56	1.56
Edmonton	1.05	1.85	2.70	2.70	1.05	1.60	2.75	2.80	0.90	1.55	2.80	2.85	0.40–0.50	0.95	1.80	1.90
Vancouver	1.00	1.75	2.95*c*	2.95*c*	1.00	1.70	3.14*a*	3.14	1.00	1.70	2.85*a*	2.85*a*	0.45–0.50	1.15	2.19*a*	2.19*a*

•a Plus 7¢ p.hr. Welfare •b Plus 8¢ p.hr. Welfare •c Plus 10¢ p.hr. Welfare •d Plus 3% Pension Plan •e Includes 6¢ p.hr. Wel. •f Includes 7¢ p.hr. Wel. •g Plus 5¢ p.hr. Wel. •h Strike

On So. Carolina Water Reservoir project: **HIGH OUTPUT AND MOBILITY KEYNOTE OPERATION OF RIDLEY CONCRETE GUN RIG**

On the construction of the R. B. Sims Prestressed Water Reservoir in Spartanburg, South Carolina, contractor The Crom Corporation, prestressed tank builders, of Gainesville, Florida proved that concrete gunning with Ridley equipment pays off—in savings of time, and in a substantial increase of concrete placed. Working in a restricted area and placing the concrete on high vertical walls, the output of the Ridley C-3VD rig was always ahead of the crew, enabling the contractor to set his own pace and get the job done in the fastest time. Asked what he thought of the Ridley rig, president of the construction firm, Ted Crom, had this to say: "We bought the Ridley with a hope to increase our production. We like it. We are contemplating purchase of another. We find we can get increased output and we like its mobility."

The experience of The Crom Corporation with the Ridley concrete gunning rig is far from unique. Contractors throughout the country and abroad are finding that gunning concrete with Ridley is faster, more accurate and more profitable. Ridley rigs are available in models with outputs ranging from 10 to 20 tons per hour, truck or trailer mounted. Ridley rigs are ruggedly built to deliver years of service; the first rig sold five years ago is still operating and making money for its owner.

Get the full story on how you can increase your profits through gunning concrete with Ridley equipment. Mail in the coupon today.

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RIDLEY and COMPANY, INC.,
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Gentlemen: Please send me complete information and specifications on Ridley concrete gunning equipment.

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10 years old and still blasting grime 40 hours a week! Dalworth Machinery Co., Dallas, uses its Malsbary 500 HPC to clean about 50 big rigs monthly, plus hundreds of parts.

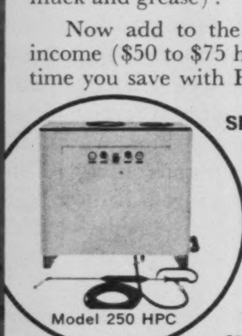
How to Boost Your Gross Profit

Steam clean with Malsbary HPC to cut costs 3 ways: ❶ by increasing mechanics' output, ❷ by reducing cleaning costs, and ❸ by getting equipment back on the job faster.

Good mechanics are hard to come by. They work better and faster on equipment that is clean. And every minute a piece of equipment is tied up for cleaning and/or repairs is money down the drain. Chart here shows how you save by using HPC cleaning instead of steam vapor—savings can be over $20.00 per rig in cleaning costs alone, plus 2½ to 9½ hours downtime. (Figures based on average cleaning times for D9-size rigs covered with muck and grease):

	Steam Vapor Cleaner	HPC
Time	5-12 hours	2½-4 hours
Cost	$18.84-$29.42	$7.37-$13.40

Now add to the savings in cleaning costs, the potential gross income ($50 to $75 hourly for each big rig) on the 2½ to 9½ hours' time you save with HPC cleaning—and you're talking real money!



Model 250 HPC

SECRET OF HPC* EFFECTIVENESS is the Malsbary thermal-hydraulic pressure system *(Hydraulic Pressure Combination—an exclusive, patented device). With it you get an enormously more effective blast of atomized cleaning droplets (up to 400 psi) to cut grease, road oils, caked mud, old paint, etc. Three sizes: From 240 gph at 300 psi to 2100 gph at 400 psi. Stationary, tricycle or trailer mount. Thousands of satisfied owners, many using 2 or more HPC units. Try HPC yourself. Write or wire about our buy-and-try plan.

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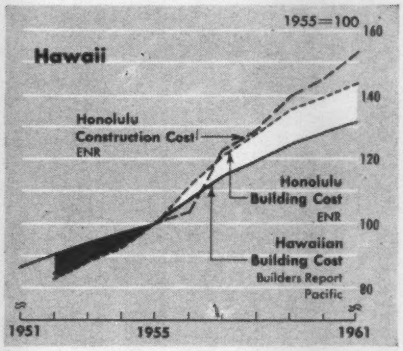
CLEANING TIP

Rebuilding rollers, idlers and tracks? You'll get a cleaner surface for hard-facing buildup, and without degreasing, by cleaning with hot solution at 300-400 psi from a Malsbary HPC cleaner.

. . . Costs Roundup



Hawaii . . .

This year, ENR introduces building and construction cost indexes for Honolulu, using the same materials and labor weighting as ENR indexes for 20 mainland cities. Latest values of the new indexes—153.1 for the construction cost and 144.8 for the building cost index, 1955 = 100.

PRICES AND WAGES	Honolulu	
MATERIALS:	1960	1961
Structural Steel Shapes	$10.80*A*	$10.40–$11.35*AE*
Reinforcing Steel Bars	8.75*A*	8.45*A*
Portland Cement	5.28*B*	5.28*B*
Lumber: Douglas fir 2"x4"	205.00*C*	205.00*C*
Gravel	3.00*DF*	3.00*DF*
Sand	4.25*DG*	4.25*DG*
LABOR:		
Common Labor:		
Heavy Construction	2.10	2.30
Building Construction	2.30	2.60
Skilled Labor:		
Bricklayers	3.45	3.65
Carpenters	3.10	3.30
Structural ironworkers	3.00	3.00

•A per cwt •B per bbl •C per Mbf •D per ton •E varies according to type and size •F #3 crushed rock •G manufactured sand. Prices are fob Honolulu. Wages are per hour and include fringe benefits.

. . . Alaska

Wages continue to move up in the largest state. Prices of major construction materials are on the downside this year, however.

Structural shape and rebar prices, while still far above the rest of the country, are sharply lower than in 1960 when strike conditions forced contractors to pay big premiums. Bulk cement is down $1.00 per bbl reflecting increased competition. Aggregates cost the same as last year.

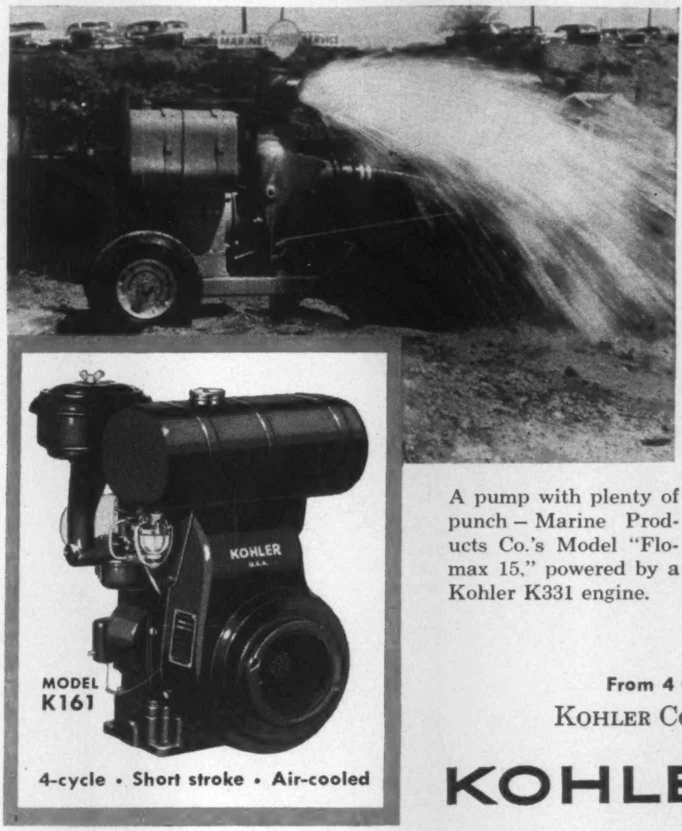
PRICES AND WAGES	Anchorage	
MATERIALS:	1960	1961
Structural Steel Shapes	$40.00*A*	$15.50–$20.50*A*
Reinforcing Steel Bars	35.00*A*	11.50– 13.50 *A*
Portland Cement	7.95*B*	6.95*B*
Lumber:		
Douglas fir 2" x 4"	127.00*Ca*	123.00*Ca*
Gravel	5.50*Dbc*	5.50*Dbc*
Sand	5.50–6.00*Dc*	5.50–6.00*Dc*
LABOR:		
Common Labor:		
Heavy Construction	4.38	4.63
Building Construction	4.38	4.63
Skilled Labor:		
Bricklayers	5.82	6.07
Carpenters	4.88	5.11
Structural Ironworkers	5.21	......

•A per cwt •B per bbl •C per Mbf •D per cubic yd •a green, 75% construction grade, 25% standard grade, random length, •b ⅜" or ¾" •c delivered jobsite. Steel and lumber prices are fob Anchorage, shipped from Seattle. Wages are per hour and include fringe benefits.

A big-muscled weight lifter and mover powered by a Kohler K91 engine – the labor-saving West Brick Buggy for carrying and hoisting building materials.

KOHLER ENGINES

out-slug rugged conditions



A pump with plenty of punch – Marine Products Co.'s Model "Flo-max 15," powered by a Kohler K331 engine.

Kohler engines have what it takes to take on tough jobs . . . Their smooth-running reliability saves down-time, builds up cost-savings on construction equipment.

Sturdy cast iron construction resists punishment . . . Hot spark means quick all-weather starting . . . Large bore and short stroke design mean less friction, more usable power, longer life.

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CIRCLE 87 ON READER SERVICE CARD

CIRCLE 89 ON READER SERVICE CARD→

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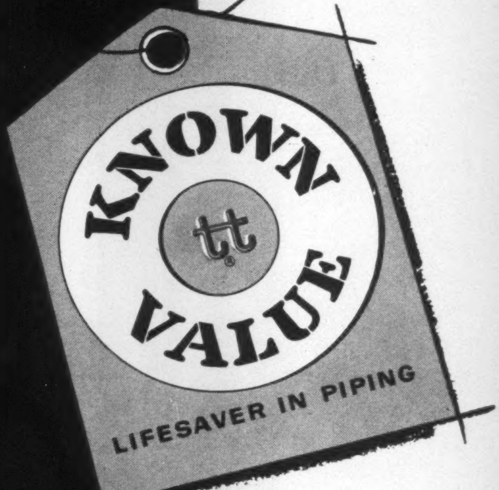

Through the science of metallurgical research has come an ever wide use of new "wonder" metals and alloys for critical-service piping systems. And to assure the selection of the *right* piping components for these systems has come the most logical trend to specify them by brand name. More and more the name specified has been TUBE-TURN. This is also most logical as no other name in welding fittings and flanges means so much.

TUBE-TURN alloy fittings and flanges are the product of pioneering, of a wealth of experience without equal, of an investment in related research and engineering exceeding that made by all other such manufacturers *combined*. TUBE-TURN alloy fittings and flanges are universally recognized and accepted as a mark of *known value*. This is why TUBE-TURN alloy fittings and flanges were selected for the now historic Manhattan Project, and specified for subsequent nuclear powered vessels. This is why TUBE-TURN corrosion-resistant, non-contaminating alloy fittings and flanges are preferred by the Petrochemical and Chemical Processing Industries. This is why experienced piping engineers everywhere look first to Tube Turns for the *latest* in alloy piping components.

Safeguard the performance of your critical-service piping systems with genuine TUBE-TURN alloy fittings and flanges. Your authorized Tube Turns Distributor is ready to serve your needs for Stainless Steels, Aluminum, Nickel, Monel, Inconel, Hastelloy B & C, Copper, Silicon Bronze, Red Brass, Admiralty Metal, Titanium, Zirconium, Zircaloy and other ferrous and non-ferrous metals and alloys. For further information write today for Bulletin TT266-J169.
TUBE TURNS, Louisville 1, Kentucky.

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Specifications calling for TUBE-TURN welding fittings and flanges with "or equal" wording need not be the open door to risk and trouble. Responsible suppliers and contractors will not only serve you honestly and properly, they will be glad to provide proof of it. They will give you an affidavit that they have met your specifications to the letter . . . that they have furnished genuine TUBE-TURN welding fittings and flanges complying with all requirements of applicable ASTM Specifications and ASA Standards. This is a sensible procedure for everyone concerned. Write us today for Bulletin 1031-J-169 on this subject.

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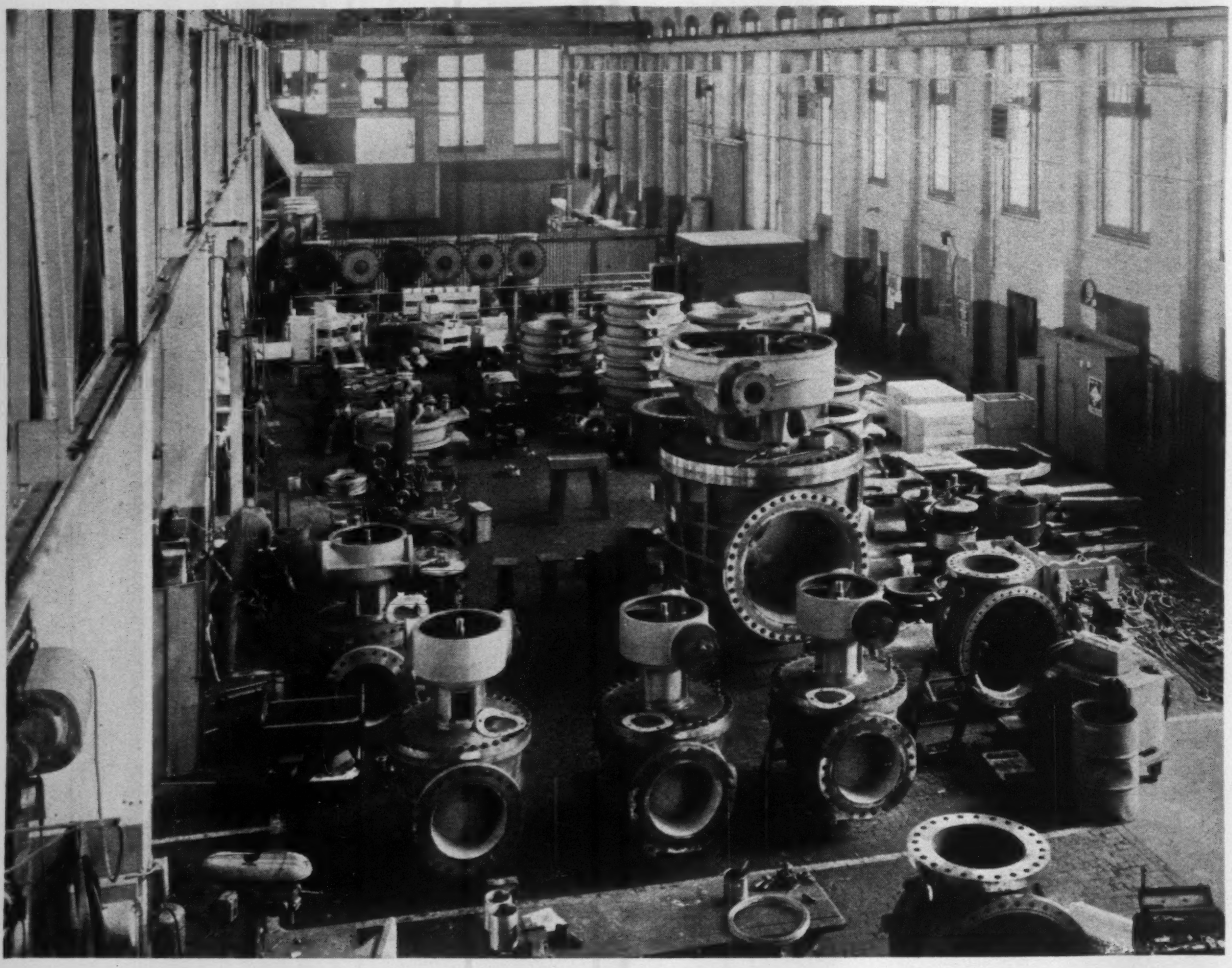


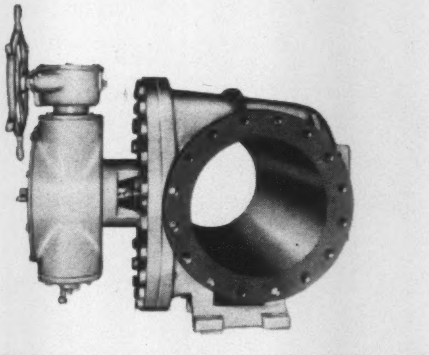
Another shipment of "habit-forming" valves

built for performance that always captures repeat customers!

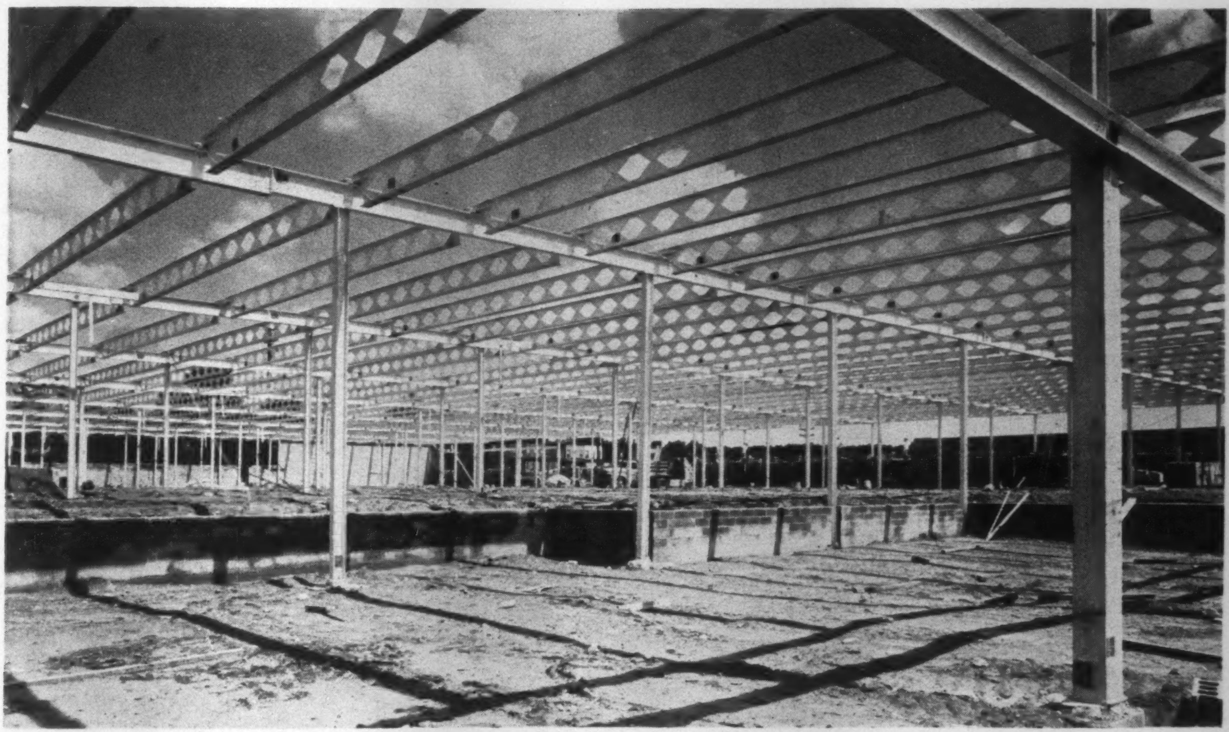
Here we see one small part of the latest shipment of Allis-Chalmers valves destined for a long-time customer. These units will augment hundreds of A-C valves already installed in the same western metropolitan water system, many of them tracing satisfactory service back a quarter of a century!

Shown are four 300-lb, 24-in. *Rotovalve* units (two motor-operated, two manual) . . . a 48-in. cast-steel *Rotovalve* for 300 psi (motor-operated) . . . and several butterfly valves of the 136 ordered (all rubber-seated, motor-operated, ranging in size from 12 to 48 inches).

Allis-Chalmers offers today's only complete, perpetual rotary-valve stocking program, assuring you fastest delivery, thanks to "off-the-shelf" availability. For help anytime, contact your nearby A-C valve representative, district office, or simply write to **Allis-Chalmers,** *Hydraulic Division, York, Pa.* A-1395



The ROTOVALVE is probably your best all-round buy in a valve. Wide open it has no more resistance to flow than a straight piece of pipe of equivalent length. Actually seats itself tighter with use. *Rotovalve is an Allis-Chalmers trademark.*



Light, open-web beams span 40 ft when fabricator devises new way to . . .

Extend Spans to Decrease Costs

New fabricating processes, which slash production costs, are stimulating fresh interest in open-web structural steel beams. These beams satisfy the need for low-cost, high-strength, lightweight framing.

Known as expanded or castellated beams, they usually are made from standard rolled sections. A typical beam may be fabricated by first making short cuts in the web of a wide-flange shape parallel and diagonal to the flanges. Then, the cut sections are moved apart and the cut edges of the deepest segments of web are welded together.

The result is an open-web beam, perhaps 50% deeper than the original wide-flange shape. And the weight per linear foot of the new shape may be half that of a wide-flange beam of the same load-carrying capacity. For example, a 14-in.-deep light beam may be converted into a castellated beam 21 in. deep. This beam would weigh only 16 lb per lin ft and have a section modulus of 42.9. The lightest wide-flange beam with about the same section modulus weighs 30 or 34 lb per lin ft, or about twice as much. Furthermore, the 21-in. beam spans 38 ft or more under usual building loads, whereas the original 14-in. section usually would not be suitable for spans over 30 ft.

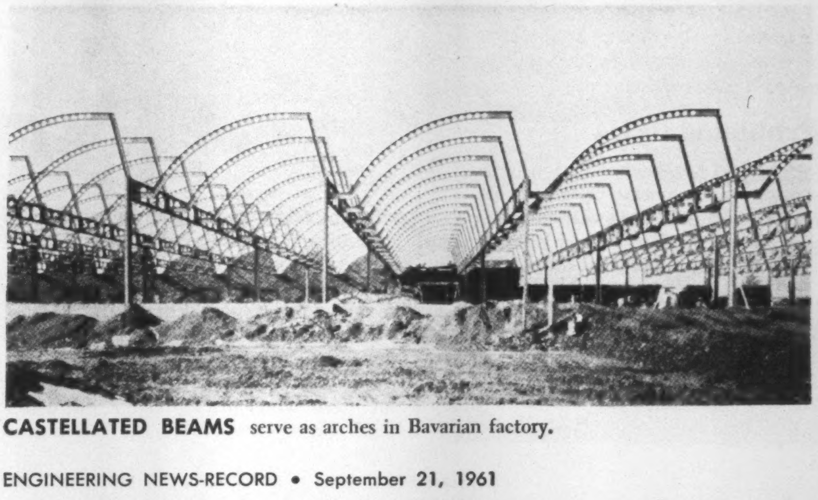
One fabricator estimates castellated beams cost $10 to $20 per ton less when erected than a rolled section of the same capacity. This includes savings in handling and erection costs because of their lighter weight.

• More ways to save money—Modifications of the fabrication process can yield additional savings. One way is to move the cut sections farther apart and weld a plate between them to form a beam with still larger section modulus.

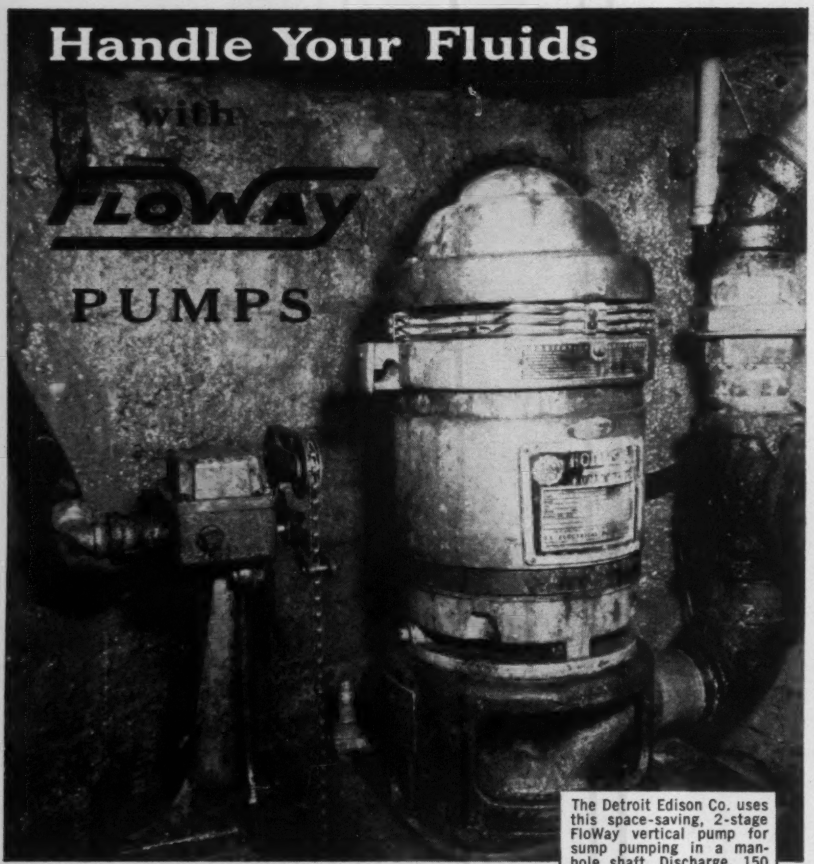
Another way is to develop an unsymmetrical section more economical for composite construction. This can be done by cutting two different-size rolled sections along the web and using the lighter of the two to form the upper part, the heavier the bottom part of a castellated beam.

Besides being lower in cost than standard sections, the open-web beams are advantageous in many types of construction because they eliminate the need for cutting openings for ducts, pipe and conduit. The openings also reduce the amount of steel area that requires painting.

In addition, castellated beams deform more easily into curved shapes for arch



CASTELLATED BEAMS serve as arches in Bavarian factory.



The Detroit Edison Co. uses this space-saving, 2-stage FloWay vertical pump for sump pumping in a manhole shaft. Discharge, 150 gpm at 90′ tdh with 5 hp, 3600 rpm motor.

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construction than do other standard shapes, if the fabricator does the bending before the cut sections are welded together. The cut halves are far more flexible than the original or final shapes.

• **New fabrication methods**—Until recently, cutting and welding in fabrication of castellated beams generally was a manual operation. Now, automatic processes are available, making fabrication less costly.

One actively promoted in the U. S. and abroad was developed by Hubert Litzka, a German engineer. Waller Corp., Crystal Lake, Ill., is introducing the process in the U. S.

In this patented process rolled sections are gas cut automatically at a rate of 15 to 20 in. per minute, depending on web thickness. Five beams can be cut simultaneously. Placed by hydraulic equipment on a roller conveyor, the sections then are fed to a machine that positions them for welding, which is done under electronic control.

Elizabeth Iron Works, Elizabeth, N. J., has patented a different process, which it is offering to U. S. fabricators. Elizabeth cuts the beams with a 1,000-ton press, instead of burning them. The process is fast, and the fabricator says the sheared edge is much stronger than a gas-cut one.

• **Growing**—A survey made by the American Institute of Steel Construction indicates increasing use of expanded beams in the U. S., both in buildings and bridges. They have been used in several hundred buildings in Los Angeles during the past 15 years. They served as framing in structures up to 20 stories high in the Northwest, and Elizabeth Iron Works has erected about 40 buildings with them.

One of the earliest reported applications was in a factory at Kemnath, Bavaria, in the 1930s. There, castellated beams were formed into curved roof girders. In the U. S., interest developed during the World War II search for ways to save steel. However, one company, The Junior Steel Co., Los Angeles, pioneered with this product before the war and has been promoting it actively since 1948. In Canada also, interest developed during the war.

Some outstanding recent projects built with expanded beams include the Claymont Senior High School Gymnasium, Claymont, Del., with 94-ft beams, and the 6-story Pilot Life Insurance Co. building, Greensboro, N. C., with 60-ft girders. In addition, there are five buildings with 250,000 sq ft of floor area in Buena Park Regional Shopping Center, Calif., framed with 25-ft castellated beams fabricated by Apex Steel Co. Also, five buildings with 500,000 sq ft of floor area in Lawrence Industrial Park, Jersey City, N. J. have 40-ft beams.

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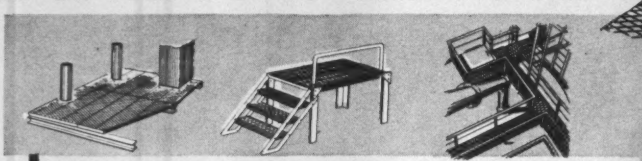

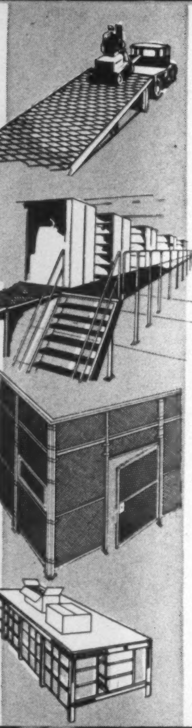

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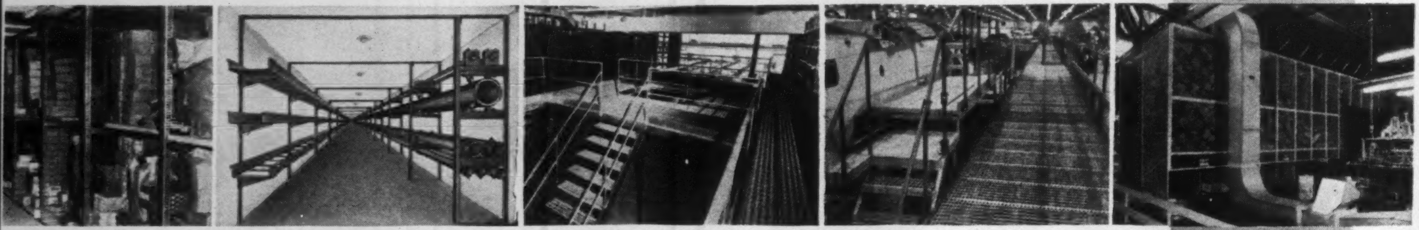

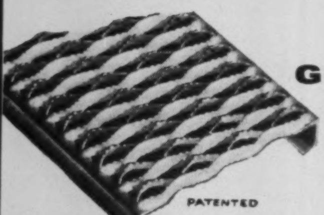

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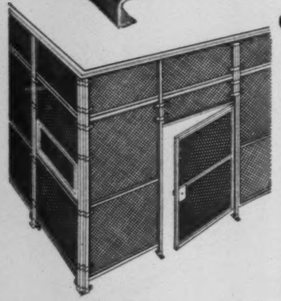

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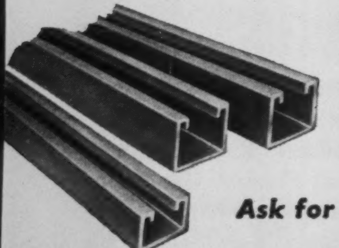

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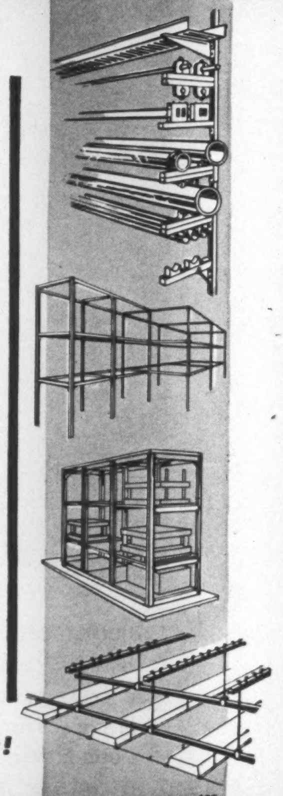

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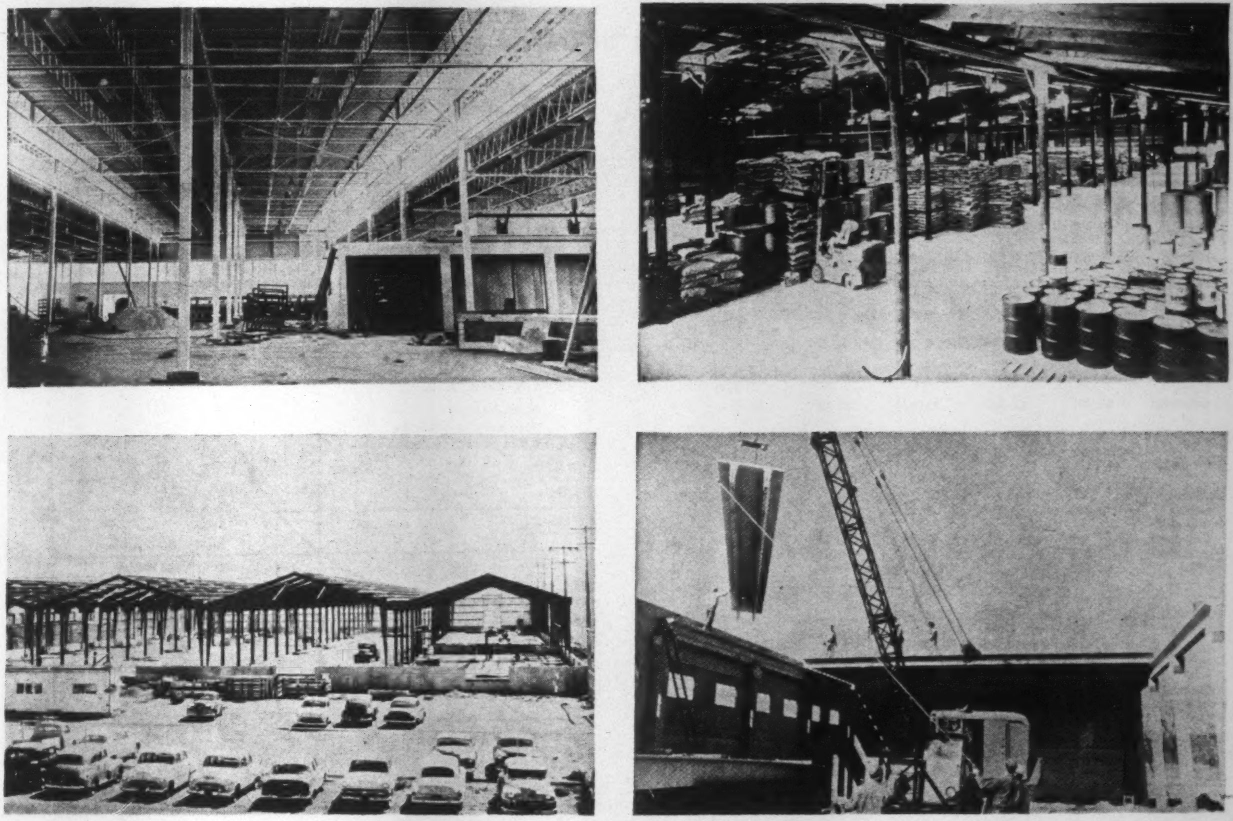


FOUR TYPES OF WAREHOUSE CONSTRUCTION are illustrated of the six of which unit costs are reported. Top left shows typical V-Lok. Top right Type E, pole-type wood construction for small bays. Large bays require wood trusses for roof support. Lower right an erection view of precast, prestressed concrete building. Lower left shows rigid frame design in multiple units.

Cost Estimating 'Erector Set' for Warehouses

With this complete assortment of unit costs, those that are variable by size of buildings, those that vary by type of building or the materials you wish to use, those that are constant, you can select your components and put together a minimum cost warehouse or add as many refinements as you wish.

Along with these many unit cost "parts", you get clear definitions or specifications of what each includes. You can adjust or "correct" for geographical location and you can escalate for materials and labor price changes. You can "correct" for the building's shape if it varies from a 5:3 length: width ratio.

The inventors of this all-purpose warehouse economic evaluation and cost estimating system are M. F. Bergstrom, engineering staff associate, H. A. Boley, cost engineer, and R. B. McPherson, design engineer, all of Design and Construction, Union Carbide Chemicals Company, a division of Union Carbide Corporation, Technical Center, South Charleston, W. Va.

Order of Economy in structures is strictly a function of the variable unit costs shown in the big unit cost tables on pages 98 & 99. It can be determined without completing the estimate of total cost. But to get the total you must add the constant costs and the mechanicals, lighting, heating, ventilators, sprinklers. No plumbing costs are included since they are small.

Minimum-Maximum Study For a 54,000-sf Warehouse

Location: Charleston, West Virginia
Dimensions: Approximately 300′ x 180′ x 14′ headroom

Size Group IV	E Pole-type Wood Frame	D Standard Steel Bldg.	B Steel Frame Open-Web Jsts	C V-Lock Steel Framing	A Conventional Steel Framing	F Precast Concrete
	$/sf of floor area					
Bare Building						
Minimum.....X	1.56	2.19	2.31	2.42	2.44	3.33
Maximum.....Y	2.54	3.38	3.55	3.59	3.57	4.07
Accessories......Z	2.27	2.27	2.27	2.27	2.27	2.27
Range of Total Unit Cost (excl of doors and firewalls)						
Minimum, no Z....	1.56	2.19	2.31	2.42	2.44	3.33
Maximum, with Z.	4.81	5.65	5.82	5.86	5.84	6.34

X Earth floor, col (2), CONSTANT UNIT COSTS, Footnotes, table p 98 . . Framing, col (5) VARIABLE UNIT COSTS, main table, Size group IV . . . Solid Wall, no windows, cols (12 & 21) . . . Roof, cols (22–28–26) . . . Substructure, col (1) except E is 0

Y Concrete floor, col 4, CONSTANT UNIT COSTS . . . Framing, col (5) VARIABLE UNIT COSTS . . . Steel sash, col (6) . . . Wall with windows, cols (17, 9, 21) . . . Roof, cols (24–26–25) . . . Substructure, col (1) except E is 0

Z Roof: Drainage,	col (30)	Heating,	col (33)
Insulation,	(29)	Gravity Roof Ventilators	(34)
Standard Lighting	(31)	Sprinkler Protection	(35)

The two how-to-do-it tables shown illustrate how to put together a minimum-maximum study (for a 54,000 sf warehouse), also how to select a minimum cost, 37,500 sf warehouse and determine the order of economy—by type of construction.

What Each Type Of Building Includes

A—Conventional Steel Framing: structural steel columns, girders, beams, and girts. Bay sizes are 24′ x 35′, beams span 24′-0″ for a flat roof.

B—Steel Framing With Open-Web Joints: structural steel columns, girders and girts, patented open-web steel joists. Bay sizes 24 ft x 35 ft, joists span 24′-0″, flat-roof. Note: Framing costs for A and B use a cast-in-place gypsum roof

Minimum Cost and Order of Economy Building

CONDITIONS: **Size:** 150ft x 250ft = 37,500 sf . . . III group in Unit Cost Table
Floor: 6″ concrete slab, 1″-0″ above grade . . . Headroom: 14-0″
Walls: Corrugated steel . . . Windows: none . . . L:W Ratio: 5:3
Roof: Corrugated steel if gable roof, deck and roofing if flat

—Unit Cost in $/sf—Unit Cost Table column numbers in ( )—

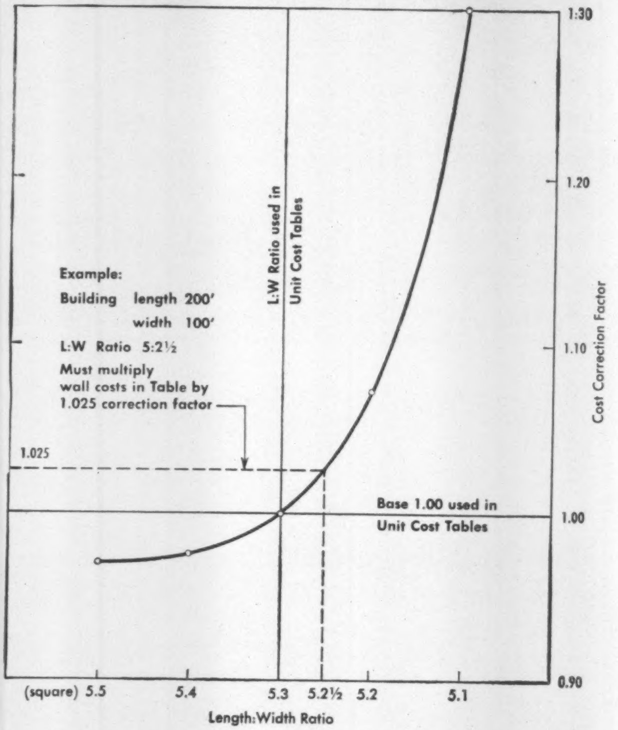
Construction Items	A—CONVENTIONAL STEEL FRAMING		B—STEEL FRAMING OPEN WEB JOISTS		C—V-LOK STEEL FRAMING		D—STANDARD STEEL BUILDING		E—POLE-TYPE WOOD BUILDING		F—PRECAST CONCRETE BUILDING	
Substructure	(1)	$0.470	(1)	$0.470	(1)	$0.470	(1)	$0.470	(1)	$0.000	(1)	$0.510
Floor, 6″ conc	(4)	0.690	(4)	0.690	(4)	0.690	(4)	0.690	(4)	0.690	(4)	0.690
Struct Framing	(5)	0.932	(5)	0.860	(5)	0.840	(5)	0.981	(5)	0.772	(5)	1.820
Walls	(12)	0.121	(12)	0.121	(12)	0.121	(12)	0.121	(12)	0.121	(20)	0.650
Roof	(28)	0.821	(28)	0.766	(28)	0.870	(22)	0.527	(27)	0.750	(26)	0.370
Roof Drains	(30)	0.279	(30)	0.279	(30)	0.279	(30)	0.279	(30)	0.279	(30)	0.279
Variable Costs, Sub-total		$3.313		$3.186		$3.270		$3.068		$2.612		$4.319
Order of Economy		5		3		4		2		1		6
Constant Costs§		0.516		0.516		0.516		0.516		0.516		0.516
Building Sub-total		$3.829		$3.702		$3.786		$3.584		$3.128		$4.835
Mechanicals*		1.760		1.760		1.760		1.760		1.760		1.760
Total		$5.589		$5.462		$5.546		$5.344		$4.888		$6.595

		Total	Per sf
§Constant Costs: $0,516/sf	(36) Personnel Doors 4 @ $90 each	$360	$0.010
	(37) Truck Doors 14 @ $1010 each	14,140	0.376
	(38) Firewall, 150 lf @ $32.50/lf	4,875	0.130
	Total for 37,500 sf area	$19,370	$0.516

*Mechanicals: $1.760/sf	(31) Standard Lighting	$0.372	(34) Roof Ventilators	$0.108
	(33) Heating	$0.885	(35) Sprinklers	0.395

Location: Charleston, W. Va.
If at South Charleston, multiply by 0.92 (see table of geographical correction factors p 98)

How Wall Costs Per Sq Ft of Floor Vary With Building's Length: Width Ratio



deck. For other types of roof deck framing costs are adjusted + or − for costs shown.

C—V-Lok Steel Framing is a patented system made by Macomber, Inc. Bay sizes, are 24′ x 35′, beams span 35′ − 0″, flat roof.

D—Standard Steel Buildings—prefabricated in either standard gable, or modified low-profiles, with rigid frames for roof support. Units are combined to provide the desired area. The most economical bay sizes are 20′ wide with lenghts varying from 40′ to 60′.

E—Pole-Type Wood Buildings—termite and rot resistant pressure treated poles are set into the ground to provide both a column and its foundation. Siding girts and roof framing are of treated timber, requires no painting. Extremely low maintenance costs and long life are claimed. Pressure or coating treatments are available to make wood non-combustible—not included in costs shown.

The roof may be gabled, or comparatively flat with a pitch of as little as ⅜″ on 12″, of wood deck with built-up roofing for the flat type, or of corrugated metal or transite for the steeper gabled type. Maximum bay sizes of 21′ x 21′ were used. (Larger bays require more expensive trussed framing)

F—Precast Concrete Buildings—have frames, side walls and roof decks of precast concrete units. Beams and roof decks are prestressed. Other units are cast using customary reinforcing. Vendors claim competitive prices within 150 to 450 miles from the casting plant.

Roof deck and side walls are structural components of the buildings. Individual roof beams and girts are not necessary. Sash or plastic panels may be used if windows are desired. Bay sizes are 20′ x 60′.

What Sizes of Buildings Are Included

I Area to 15,000 sf
II Area 16,000 to 30,000 sf
III Area 31,000 to 50,000 sf
IV Area 51,000 to 70,000 sf
V Area 71,000 to 90,000 sf
VI Area 91,000 to 110,000 sf
VII Area over 110,000 sf

What Building Components Cover

1 **Substructure:** excavation, backfill, forms, reinforcing, concrete, anchor bolts, for foundations, grade beams

2, 3 & 4 **Floors** (see CONSTANT UNIT COSTS section of table): excavation of topsoil, added compacted backfill and the finished floor

5 **Structural Framing:** complete structural superstructure (roof deck included only for precast concrete buildings)

6–7 **Windows:** 6, continuous steel sash, 4-light high and fixed. Glass and glazing included in costs. 7, plastic panels have area equivalent to 4-light high window area in 6.

8–11 **Walls:** Costs include block with brick veneer and solid block. Not included are weatherproofing or painting.

12–21 **Walls, Special Siding,** costs under "solid" are blank, no provisions for windows. "With Window Openings" costs are for wall only with neat openings

22–28 **Roof Deck and Covering** 7 types of decks shown, cols 25-28 decks require covering, include its cost. (For columns 22-24 see CONSTANT UNIT COSTS section of table)

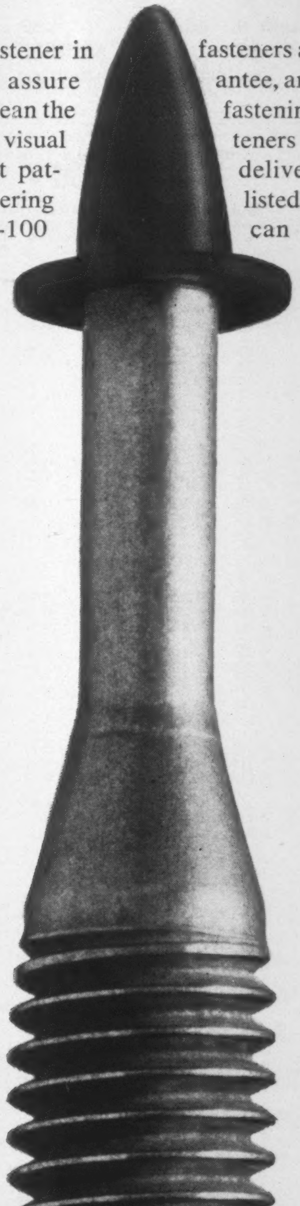
29 **Roof Insulation** (See CONSTANT UNIT COSTS section of table p. 98) 2″ of glass fiber

30 **Roof Drains** galvanized downspouts, cast iron sewers within building

31–32 **Lighting and Grounding:** 5 foot candles of light at floor level, all necessary equipment for wiring plus 31, conventional incandescent bulbs and reflectors. 32, vapor-tight fixtures

33 **Unit Heaters and Power Wiring:** averaged for all types of construction. Heat added to

Why we put a nose cone on our fasteners



Four important reasons. 1) To hold the fastener in the barrel. 2) To guide the fastener and assure straight penetration. 3) To automatically clean the tool's barrel between fastenings. 4) To show visual proof of proper penetration. Without that patented "nose cone" and without our austempering process, we could never guarantee 100-for-100 fasteners and sleep nights. This way, you get the guarantee, and we get some rest. More powder actuated fastenings are made with Ramset red-tipped fasteners than all others combined. For immediate delivery call your local Ramset dealer. He's listed in the Yellow Pages under "Tools." You can count on him for on-the-site deliveries.

Ramset® WINCHESTER-WESTERN DIVISION **Olin**
287-I Winchester Ave., New Haven 4, Conn.

(Story starts on p. 95)

Warehouse Unit Costs Analyzed: 6 Types . . .

CONDITIONS: 14'-0" headroom; ratio of length to width 5:3 . . . Unit costs shown include OWNER'S expense (5%) and CONTRACTOR'S overhead and profit . . . They do not include ARCHITECT'S and ENGINEER'S fees or contingency allowance. They represent experience in 1960 . . . The location is Charleston, W. Va.

2-3-4 FLOORS see CONSTANT UNIT COSTS below *

			VARIABLE UNIT COST CONSTRUCTION ITEMS . . .									
			WINDOWS		WALLS (NON-BEARING MASONRY)				WALLS			
					BRICK 4" BLOCK 4"		BLOCK 8"		CORR. GALV. STEEL		CORR. ALUMINUM	
BUILDING TYPE AND FLOOR SPACE	SUB-STRUC-TURE 1	STRUC-TURAL FRAMING 5	Steel Sash 6	Plastic Panels 7	Solid 8	With Window Openings 9	Solid 10	With Window Openings 11	Solid 12	With Window Openings 13	Solid 14	With Window Openings 15
I — AREA TO 15,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.780	1.149	0.526	0.427	1.241	0.738	0.689	0.409	0.246	0.147	0.327	0.195
B — STEEL FRAMING & O-W JOISTS	0.780	1.069	0.526	0.427	1.241	0.738	0.689	0.409	0.246	0.147	0.327	0.195
C — V-LOK STEEL FRAMING	0.780	0.840	0.526	0.427	1.241	0.738	0.689	0.409	0.246	0.147	0.327	0.195
D — STANDARD STEEL BLDG.	0.760	1.191	0.526	0.427	1.241	0.738	0.689	0.409	0.246	0.147	0.327	0.195
E — POLE-TYPE WOOD BLDG.	.....	0.963	0.526	0.427	.....	.....	.....	.....	0.246	0.147	0.327	0.195
F — PRECAST CONCRETE BLDG.	0.810	1.995	0.526	0.427	.....	.....	.....	.....	.....	.....	.....	.....
II — AREA 16,000 TO 30,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.600	1.022	0.371	0.301	0.876	0.521	0.487	0.289	0.174	0.104	0.231	0.138
B — STEEL FRAMING & O-W JOISTS	0.600	0.955	0.371	0.301	0.876	0.521	0.487	0.289	0.174	0.104	0.231	0.138
C — V-LOK STEEL FRAMING	0.600	0.840	0.371	0.301	0.876	0.521	0.487	0.289	0.174	0.104	0.231	0.138
D — STANDARD STEEL BLDG.	0.570	1.011	0.371	0.301	0.876	0.521	0.487	0.289	0.174	0.104	0.231	0.138
E — POLE-TYPE WOOD BLDG.	.....	0.859	0.371	0.301	.....	.....	.....	.....	0.174	0.104	0.231	0.138
F — PRECAST CONCRETE BLDG.	0.610	1.840	0.371	0.301	.....	.....	.....	.....	.....	.....	.....	.....
III — AREA 31,000 TO 50,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.470	0.932	0.256	0.216	0.619	0.368	0.344	0.205	0.121	0.072	0.161	0.096
B — STEEL FRAMING & O-W JOISTS	0.470	0.860	0.256	0.216	0.619	0.368	0.344	0.205	0.121	0.072	0.161	0.096
C — V-LOK STEEL FRAMING	0.470	0.840	0.256	0.216	0.619	0.368	0.344	0.205	0.121	0.072	0.161	0.096
D — STANDARD STEEL BLDG.	0.470	0.981	0.256	0.216	0.619	0.368	0.344	0.205	0.121	0.072	0.161	0.096
E — POLE-TYPE WOOD BLDG.	.....	0.772	0.256	0.216	.....	.....	.....	.....	0.121	0.072	0.161	0.096
F — PRECAST CONCRETE BLDG.	0.510	1.820	0.256	0.216	.....	.....	.....	.....	.....	.....	.....	.....
IV — AREA 51,000 TO 70,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.430	0.910	0.216	0.181	0.524	0.312	0.291	0.174	0.105	0.063	0.139	0.084
B — STEEL FRAMING & O-W JOISTS	0.430	0.830	0.216	0.181	0.524	0.312	0.291	0.174	0.105	0.063	0.139	0.084
C — V-LOK STEEL FRAMING	0.430	0.840	0.216	0.181	0.524	0.312	0.291	0.174	0.105	0.063	0.139	0.084
D — STANDARD STEEL BLDG.	0.420	0.966	0.216	0.181	0.524	0.312	0.291	0.174	0.105	0.063	0.139	0.084
E — POLE-TYPE WOOD BLDG.	.....	0.750	0.216	0.181	.....	.....	.....	.....	0.105	0.063	0.139	0.084
F — PRECAST CONCRETE BLDG.	0.460	1.800	0.216	0.181	.....	.....	.....	.....	.....	.....	.....	.....
V — AREA 71,000 TO 90,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.400	0.893	0.181	0.150	0.438	0.261	0.244	0.145	0.084	0.050	0.115	0.066
B — STEEL FRAMING & O-W JOISTS	0.400	0.805	0.181	0.150	0.438	0.261	0.244	0.145	0.084	0.050	0.115	0.066
C — V-LOK STEEL FRAMING	0.400	0.840	0.181	0.150	0.438	0.261	0.244	0.145	0.084	0.050	0.115	0.066
D — STANDARD STEEL BLDG.	0.400	0.958	0.181	0.150	0.438	0.261	0.244	0.145	0.084	0.050	0.115	0.066
E — POLE-TYPE WOOD BLDG.	.....	0.733	0.181	0.150	.....	.....	.....	.....	0.084	0.050	0.115	0.066
F — PRECAST CONCRETE BLDG.	0.430	1.790	0.181	0.150	.....	.....	.....	.....	.....	.....	.....	.....
VI — AREA 91,000 TO 110,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.380	0.883	0.163	0.135	0.393	0.234	0.219	0.130	0.073	0.044	0.097	0.058
B — STEEL FRAMING & O-W JOISTS	0.380	0.793	0.163	0.135	0.393	0.234	0.219	0.130	0.073	0.044	0.097	0.058
C — V-LOK STEEL FRAMING	0.380	0.840	0.163	0.135	0.393	0.234	0.219	0.130	0.073	0.044	0.097	0.058
D — STANDARD STEEL BLDG.	0.380	0.952	0.163	0.135	0.393	0.234	0.219	0.130	0.073	0.044	0.097	0.058
E — POLE-TYPE WOOD BLDG.	.....	0.723	0.163	0.135	.....	.....	.....	.....	0.073	0.044	0.097	0.058
F — PRECAST CONCRETE BLDG.	0.410	1.780	0.163	0.135	.....	.....	.....	.....	.....	.....	.....	.....
VII — AREA OVER 110,000 sf												
A — CONVENTIONAL STEEL FRAMING	0.340	0.872	0.115	0.096	0.278	0.166	0.155	0.093	0.052	0.031	0.069	0.041
B — STEEL FRAMING & O-W JOISTS	0.340	0.782	0.115	0.096	0.278	0.166	0.155	0.093	0.052	0.031	0.069	0.041
C — V-LOK STEEL FRAMING	0.340	0.840	0.115	0.096	0.278	0.166	0.155	0.093	0.052	0.031	0.069	0.041
D — STANDARD STEEL BLDG	0.340	0.940	0.115	0.096	0.278	0.166	0.155	0.093	0.052	0.031	0.069	0.041
E — POLE-TYPE WOOD BLDG.	.....	0.712	0.115	0.096	.....	.....	.....	.....	0.052	0.031	0.069	0.041
F — PRECAST CONCRETE BLDG.	0.360	1.770	0.115	0.096	.....	.....	.....	.....	.....	.....	.....	.....

*CONSTANT UNIT COST CONSTRUCTION ITEMS, all sizes, all types of buildings: Columns 2-3-4, FLOORS, 1'-0" above grade, 2 Compacted earth $0.174, 3 Asphalt, 6" stone $0.362, 4 Concrete, 6" slab $0.690, 29 ROOF INSULATION (2" Fiberglass) $0.360, 36-37 EXTERIOR DOORS, 36 3'x6'-8" Personnel $90 each, 37 12'x14' Truck $1010 each, 38 FIREWALLS $32.50/lf.

maintain minimum indoor temperature of +55°F at a minimum outdoor of 0°F.

34 **Gravity Roof Ventilators**: one 24" ϕ ventilator for each 2,500 sf of floor area in warehouse Sizes I to V; one 30" ventilator for each 4200 sf in Sizes VI & VII

35 **Fire Protection, Sprinkler**: one sprinkler head for each 50 sf of floor area (check further if contents require special protection)

36–37 **Exterior Doors**: individual steel doors, truck doors hand operated (See CONSTANT UNIT COSTS section of table)

38 **Firewalls**: foundation and 12" slag block wall from floor to roof with no openings. Number and length depends on size of building and local codes. (See CONSTANT UNIT COSTS section)

Estimating Assumptions

- **Locations Cost** shown are for Charleston, W. Va. area = 1.00. To adjust costs to other locations use these correction factors:

So. Charleston-Institute	0.92	Torrance, California	1.04
Seadrift, Texas	0.92	Whiting, Indiana	1.10
Texas City, Texas	0.94	Niagara Falls, N. Y.	1.12
New York City Area	1.22	Montreal, Canada	0.87

- **Escalation** for price and wage changes:

7 Sizes of Buildings . . . 38 Construction Items

UNIT COSTS are in $/sf of floor space unless otherwise noted . . . To correct for geographical variations see preceding table . . . For escalating, unit costs shown are tied to Engineering News-Record Building Cost Index for April, 1959–543 . . . Divide appropriate index value by 543 and multiply by unit costs shown to correct for price changes.

DOLLARS PER SQUARE FOOT, EXCEPT AS NOTED

(SPECIAL SIDING) CORR. TRANSITE		GALBESTOS PROT. METAL		CONCRETE PANELS			ROOF DECK & 20-YR. BONDED COVERING						LIGHTING & GROUNDING						
Solid 16	With Window Openings 17	Solid 18	With Window Openings 19	Solid 20	With Window Openings 21	22, 23, 24 ROOF ONLY D & E, see CONSTANT UNIT COSTS below *	Gypsum Slab 25	Precast Concrete Channels 26	Wood Deck 27	Long Span Q-Deck 28	29 ROOF INSULATION, see CONSTANT UNIT COSTS below *	ROOF DRAINAGE 30	Standard 31	Explosion Proof 32	UNIT HEATERS & POWER WIRING 33	GRAVITY ROOF VENTILATORS 34	FIRE PROTECTION (SPRINKLERS) 35	36, 37, 38 DOORS & FIREWALLS see CONSTANT UNIT COSTS below *	
0.457	0.272	0.686	0.409	.....	.....		0.980	1.010	.....	0.821		0.456	0.391	0.408	1.182	0.108	0.418		A
0.457	0.272	0.686	0.409	.....	.....		0.980	1.068	.....	0.766		0.456	0.391	0.408	1.182	0.108	0.418		B
0.457	0.272	0.686	0.409	.....	.....		1.098	.....	.....	0.870		0.456	0.391	0.408	1.182	0.108	0.418		C
0.457	0.272	.....	.....	.....	.....		.....	.....	.....	.....		0.456	0.391	0.408	1.182	0.108	0.418		D
0.457	0.272	.....	.....	.....	.....		.....	.....	0.750	.....		0.456	0.391	0.408	1.182	0.108	0.418		E
.....	.....	.....	.....	1,314	1,314		.....	†0.370	.....	.....		0.456	0.391	0.408	1.182	0.108	0.418		F
																			II
0.323	0.192	0.485	0.289	.....	.....		0.980	1.010	.....	0.821		0.340	0.385	0.401	1.026	0.108	0.410		A
0.323	0.192	0.485	0.289	.....	.....		0.980	1.068	.....	0.766		0.340	0.385	0.401	1.026	0.108	0.410		B
0.323	0.192	0.485	0.289	.....	.....		1.098	.....	.....	0.870		0.340	0.385	0.401	1.026	0.108	0.410		C
0.323	0.192	.....	.....	.....	.....		.....	.....	.....	.....		0.340	0.385	0.401	1.026	0.108	0.410		D
0.323	0.192	.....	.....	.....	.....		.....	.....	0.750	.....		0.340	0.385	0.401	1.026	0.108	0.410		E
.....	.....	.....	.....	0.920	0.920		.....	†0.370	.....	.....		0.340	0.385	0.401	1.026	0.108	0.410		F
																			III
0.231	0.137	0.343	0.205	.....	.....		0.980	1.010	.....	0.821		0.279	0.372	0.388	0.885	0.108	0.395		A
0.231	0.137	0.343	0.205	.....	.....		0.980	1.068	.....	0.766		0.279	0.372	0.388	0.885	0.108	0.395		B
0.231	0.137	0.343	0.205	.....	.....		1,098	.....	.....	0.870		0.279	0.372	0.388	0.885	0.108	0.395		C
0.231	0.137	.....	.....	.....	.....		.....	.....	.....	.....		0.279	0.372	0.388	0.885	0.108	0.395		D
0.231	0.137	.....	.....	.....	.....		.....	.....	0.750	.....		0.279	0.372	0.388	0.885	0.108	0.395		E
.....	.....	.....	.....	0.650	0.650		.....	†0.370	.....	.....		0.279	0.372	0.388	0.885	0.108	0.395		F
																			IV
0.179	0.107	0.290	0.173	.....	.....		0.980	1.010	.....	0.821		0.226	0.360	0.376	0.825	0.108	0.380		A
0.179	0.107	0.290	0.173	.....	.....		0.980	1.068	.....	0.766		0.226	0.360	0.376	0.825	0.108	0.380		B
0.179	0.107	0.290	0.173	.....	.....		1.098	.....	.....	0.870		0.226	0.360	0.376	0.825	0.108	0.380		C
0.179	0.107	.....	.....	.....	.....		.....	.....	.....	.....		0.226	0.360	0.376	0.825	0.108	0.380		D
0.179	0.107	.....	.....	.....	.....		.....	.....	0.750	.....		0.226	0.360	0.376	0.825	0.108	0.380		E
.....	.....	.....	.....	0.530	0.530		.....	†0.370	.....	.....		0.226	0.360	0.376	0.825	0.108	0.380		F
																			V
0.153	0.091	0.243	0.145	.....	.....		0.980	1.010	.....	0.821		0.204	0.353	0.369	0.737	0.108	0.365		A
0.153	0.091	0.243	0.145	.....	.....		0.980	1.068	.....	0.766		0.204	0.353	0.369	0.737	0.108	0.365		B
0.153	0.091	0.243	0.145	.....	.....		1.098	.....	.....	0.870		0.204	0.353	0.369	0.737	0.108	0.365		C
0.153	0.091	.....	.....	.....	.....		.....	.....	.....	.....		0.204	0.353	0.369	0.737	0.108	0.365		D
0.153	0.091	.....	.....	.....	.....		.....	.....	0.750	.....		0.204	0.353	0.369	0.737	0.108	0.365		E
.....	.....	.....	.....	0.460	0.460		.....	†0.370	.....	.....		0.204	0.353	0.369	0.737	0.108	0.365		F
																			VI
0.140	0.083	0.217	0.129	.....	.....		0.980	1.010	.....	0.821		0.190	0.347	0.363	0.672	0.077	0.350		A
0.140	0.083	0.217	0.129	.....	.....		0.980	1.068	.....	0.766		0.190	0.347	0.363	0.672	0.077	0.350		B
0.140	0.083	0.217	0.129	.....	.....		1,098	.....	.....	0.870		0.190	0.347	0.363	0.672	0.077	0.350		C
0.140	0.083	.....	.....	.....	.....		.....	.....	.....	.....		0.190	0.347	0.363	0.672	0.077	0.350		D
0.140	0.083	.....	.....	.....	.....		.....	.....	0.750	.....		0.190	0.347	0.363	0.672	0.077	0.350		E
.....	.....	.....	.....	0.410	0.410		.....	†0.370	.....	.....		0.190	0.347	0.363	0.672	0.077	0.350		F
																			VII
0.100	0.060	0.154	0.092	.....	.....		0.980	1.010	.....	0.821		0.154	0.334	0.349	0.586	0.077	0.335		A
0.100	0.060	0.154	0.092	.....	.....		0.980	1.068	.....	0.766		0.154	0.334	0.349	0.586	0.077	0.335		B
0.100	0.060	0.154	0.092	.....	.....		1.098	.....	.....	0.870		0.154	0.334	0.349	0.586	0.077	0.335		C
0.100	0.060	.....	.....	.....	.....		.....	.....	.....	.....		0.154	0.334	0.349	0.586	0.077	0.335		D
0.100	0.060	.....	.....	.....	.....		.....	.....	0.750	.....		0.154	0.334	0.349	0.586	0.077	0.335		E
.....	.....	.....	.....	0.290	0.290		.....	†0.370	.....	.....		0.154	0.334	0.349	0.586	0.077	0.335		F

Building types D & E only: Columns 22-23-24, ROOF only 22 Corr. Galv. Steel $0.527, 23 Corr. Aluminum $0.665, 24 Corr. Asbestos $0.780.
(NOTE: Corrugated roof material cannot be used on roofs flatter than 4:12, therefore these prices for E—Pole-type wood buildings apply only to those with gable roofs)
†Covering only, deck included as framing

Costs shown were effective as of April, 1960. They are tied to the Engineering News-Record Building Cost Index of that date, value 543 and can be updated by getting the appropriate value of the index, base 1913 = 100 and applying the indicated correction factor.

- **Ratio of length to width** is 5:3. (See curve for correction factors for adjusting to other ratios)
- **Foundations** are concrete. Assumed soil bearing value is 3000 psf (except for E, pole-type construction)
- **Site** is level. Costs include removal of one foot of topsoil and its replacement with compacted earth. Finished floor elevation above grade 1′-0″
- **Snow load** design is 30 psf, wind load is 20 psf
- **Clear height inside** is 14′-0″. To adjust for other heights: Divide desired height by 14 . . . apply this factor only to concrete substructure, structural framing and walls. For example, for a height of 20′ the correction ratio is 20/14 = 1.43, for a height of 12′ it is 12/14 = 0.856
- **Bay sizes** shown (in building type descriptions) are selected as the most economical column spacing for each type

Costs include painting for items which usually require paint.

Where the Building Dollar Goes

Unit and Ratio Costs supplied through the courtesy of Gotham Construction Corp., New York, N. Y.; W. J. Barney Corp., New York, N. Y.; Albert Elia Building Co., Inc., Niagara Falls, N. Y.; Wm. C. Pahl Construction Co., Inc., Syracuse, N. Y.; Walter Kidde Constructors, Inc., New York, N. Y.

TYPE OF: Building	Middle Income Housing	School	University Science Building	Parking Garage & Store	Apartments	Hospital & Nurses Quarters	Office-Factory
Construction: frame outside walls	reinforced concrete brick	steel brick & metal	steel precast wall panels	concrete plastic skin & ornamental metal	reinforced concrete brick	steel & concrete brick w/concrete block backup	steel brick & metal
Date construction started	March 1, 1960	Sept. 1960	Dec. 1, 1960	July 1960	Oct. 1959	Aug. 1959	July 1958
Location	Bronx, N. Y.	Long Island, N. Y.	Niagara Falls, N. Y.	Syracuse, N. Y.	Syracuse, N. Y.	Westchester, N. Y.	Utica, N. Y. area
SIZE OF BLDG:							
Height, stories	14 each	2	3	10	12	8, 2 basements & penthouse	1, 23 ft high
Floor area, sq ft	.....	59,000 sf	49,800 sf	71,988 sf	120,000 sf	283,465 sf	370,000 sf
Volume, cu ft	2,223,000 cf	878,000 cf	596,740 cf	945,000 cf	1,115,000 cf	3,617,780 cf	8,900,000 cf
RANGE of Cost of this type Bldg:							
$ per sq ft	.....	$30.80	$21.47	$10.33	$14.00	$28.98	$9.45
$ per cu ft	$1.30	2.07	1.79	0.79	1.51	2.27	0.39
% Air Conditioned	0%	45%	0%	0%	100%	operating rooms only	18%
Engineering News-Record Building Cost Index (1913=100) 20-cities average	555	563	562	563	555	554	524

PRINCIPAL ITEMS OF COST	Middle Income Housing		School		University Science Building		Parking Garage & Store		Apartments		Hospital & Nurses Quarters		Office-Factory	
$ and % of Total Cost	$	%	$	%	$	%	$	%	$	%	$	%	$	%
Excavation and site improvements	169,000	5.85	100,500	5.54	24,600	2.30	22,425	3.00	35,000	2.10	564,810	6.88	502,580	14.35
Foundations	84,000	2.91	121,100	6.67	61,150	5.72	54,400	7.30	20,000	1.19	257,900	3.14	141,240	4.03
Structural frame	690,000	23.90	333,400	18.40	70,750	6.60	221,000	29.70	295,000	17.56	1,048,280	12.76	473,430	13.52
Cement finish work	.....	.....	18,900	1.04	53,900	5.04	17,250	2.32	28,000	1.66	244,900	2.98	277,490	7.92
Exterior masonry	230,000	7.95	185,400	10.20	.....	.....	13,300	1.80	150,000	8.93	516,110	6.28	94,930	2.71
Metal wall panels	.....	.....	57,600	3.17	153,000g	14.31	18,550n	2.50	.....	.....	.....	.....	99,960	2.85
Interior partitions	40,000	1.38	incl in ext masonry		33,100	3.01	1,855	0.25	incl in lath & plaster		635,310	7.73	203,370	5.80
Toilet partitions	.....	.....	1,600	0.09	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Carpentry and millwork	102,000	3.53	21,600	1.20	12,500	1.17	7,925	1.06	50,000	2.98	168,380	2.05	65,510	1.87
Glazing	54,000a	1.87	.....	.....	6,400	0.60	.....	.....	.....	.....	.....	.....	.....	.....
Sash and glazing	.....	.....	29,800	1.64	.....	.....	10,850o	1.46	30,000	1.79	177,440	2.16	17,810	0.51
Doors	36,000	1.24	9,000	0.50	incl in glazing		2,425	0.33	incl in millwork		6,130	0.08	20,380	0.58
Roofing	27,000	0.93	55,000	3.03	7,000	0.65	6,800	0.90	15,500	0.92	61,260	0.75	157,810	4.51
Insulation	4,500	0.15	2,800	0.15	9,550h	0.90	.....	.....	.....	.....	.....	.....	.....	.....
Waterproofing and dampproofing	10,000	0.34	7,400	0.41	1,500	0.14	54.00	0.01	6,000	0.36	39,200	0.48	500.00	.....
Metal lath, furring, and plastering	282,000	9.75	10,600	0.58	24,000	2.24	.....	.....	165,000	9.82	329,830	4.02	22,690	0.65
Hollow metal work	34,000	1.18	11,000	0.61	12,300	1.15	2,425	0.33	16,500	0.98	50,100	0.61	21,410	0.61
Miscellaneous iron and ornamental metal	61,000	2.10	25,600	1.40	22,700	2.12	63,800	8.57	35,000	2.08	102,280	1.25	44,350	1.27
Tile, terrazzo, and marble	44,000	1.52	21,100	1.16	47,000	4.40	.....	.....	40,000	2.38	159,800	1.95	30,400	0.87
Floor covering	38,000	1.31	5,700	0.31	3,600i	0.34	.....	.....	46,000	2.74	99,780	1.22	22,500	0.64
Painting	62,000	2.14	37,900	2.10	12,000	1.12	4,500	0.60	40,000	2.38	94,000	1.15	59,270	1.69
Finish hardware	9,000	0.31	13,300	0.73	11,000	1.03	incl in hollow met		5,000	0.30	100,270	1.22	17,790	0.51
Venetian blinds and shades	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11,400	0.14	.....	.....
Acoustical ceilings	1,000	0.03	19,300	1.06	54,000j	5.05	.....	.....	.....	.....	58,040	0.71	21,640	0.62
Plumbing	250,000	8.64	105,900	5.80	85,000	7.95	12,569	1.69	220,000	13.09	555,060	6.76	143,240	4.09
Heating, ventilating, and air conditioning	171,000b	5.91	282,500	15.60	96,000	9.00	4,900b	0.66	170,000	10.12	1,036,300	12.62	492,420	14.06
Electrical work and light fixtures	174,000	6.02	286,100	15.80	152,000	14.22	22,485p	3.02	130,000t	7.74	678,350	8.26	396,110	11.31
Elevators	120,000	4.15	18,800	1.03	15,000	1.40	244,575q	32.80	58,000	3.45	406,690	4.95	.....	.....
Incinerator	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13,500v	0.16	.....	.....
Fire protection system	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,580	0.02	.....	.....
Sprinkler	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	96,580	2.76
Special service equipment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	35,030y	1.00
Power plant	.....	.....	.....	.....	10,900k	1.02	.....	.....	.....	.....	.....	.....	.....	.....
Production equipment	.....	.....	23,100e	1.27	.....	.....	.....	.....	115,000u	6.84	246,580w	3.00	.....	.....
Lockers and shelving	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	25,790	0.31	.....	.....
Pneumatic tubes	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52,060	0.63	.....	.....
Hospital casework	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	201,280	2.45	.....	.....
X-ray equipment and protection	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	34,270	0.42	.....	.....
Sterilizers and operating room lights	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	131,660	1.60	.....	.....
Laboratory equipment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	31,830	0.39	.....	.....
Laundry equipment	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65,530	0.79	.....	.....
Other features	54,000c	1.87	9,300f	0.51	10,250l	0.96	9,450r	1.30	.....	.....	7,830x	0.08	44,450z	1.27
Miscellaneous	145,000d	5.02	.....	.....	.....	.....	2,991s	0.40	10,000	0.59	.....	.....	.....	.....
Parking lot	.....	.....	.....	.....	80,000m	7.56	.....	.....	.....	.....	.....	.....	.....	.....
Total	$2,891,500	100%	$1,814,300	100%	$1,069,200	100%	$744,529	100%	$1,680,000	100%	$8,213,530	100%	$8,900,000	100%

a incl windows b heating & ventilating only c incl refrigerators, gas ranges, medicine cabinets d incl general supervision e kitchen equip f folding partitions & doors g ext precast panels, porcelain & alum h gypsum roof i owner supplied mat j radiant heat coils incl k incl steam tunnel from bldg to power plant l chalkboard & corkboards m for entire campus n no metal—plastic ext facing o incl alum curtain wall p incl sign q incl controls r metal deck on elevator, penthouse & 1 story adjacent store s not covered t incl intercommunication systems & T.V. u kitchen equip v & boiler stack w food service equip x incl mailboxes, $1,270—0.01%; platform scales, $3,090—0.03%; mortuary refrigerator, $3,470—0.04% y adjustable loading docks & car lift z entrance features

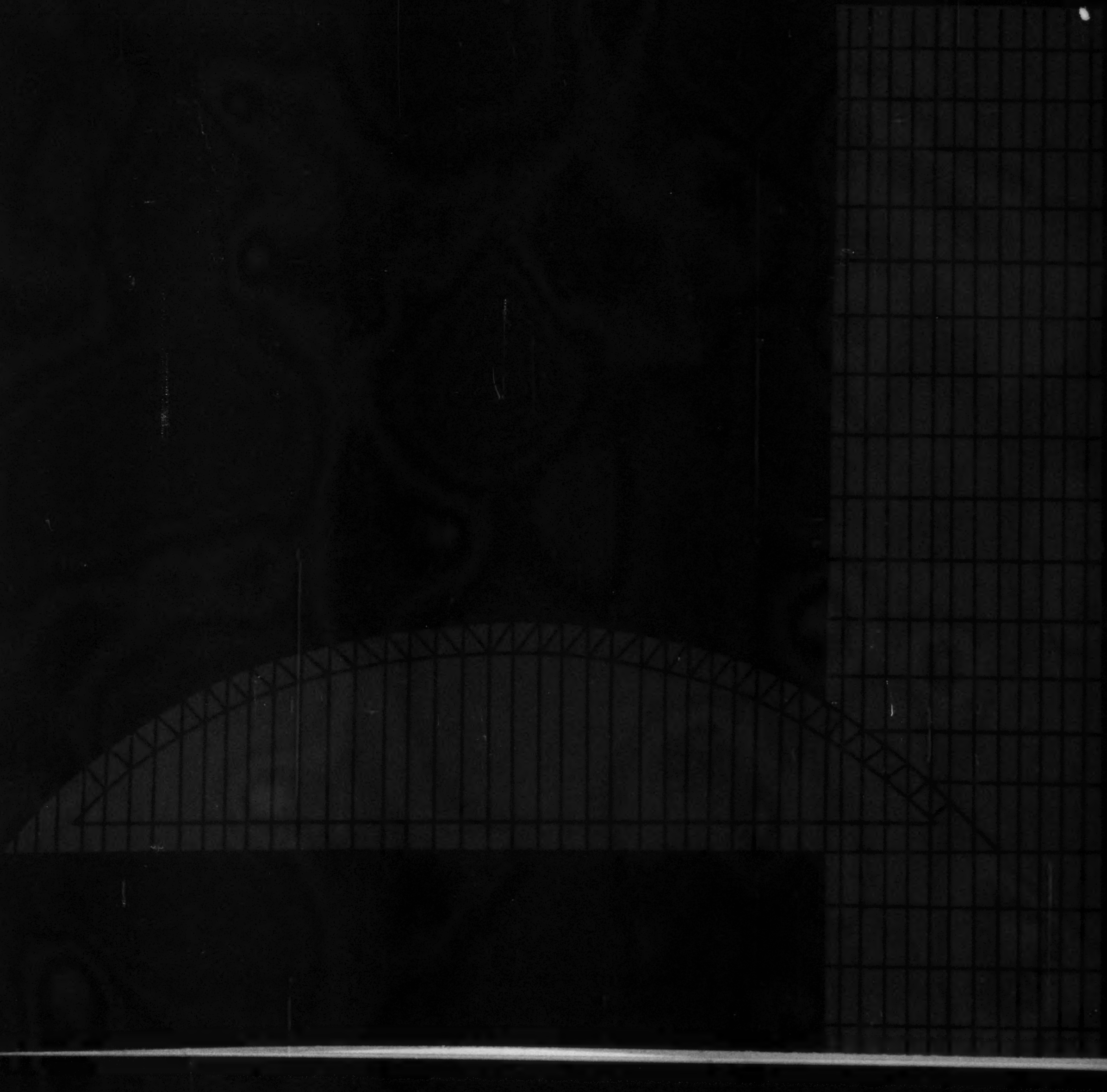
Take a good look at what you can do with the complete family of USS Design Steels

Over the past 50 years, the steel industry has developed at least 10,000 new steels! Many of these steels have been proved thoroughly on the job and wait only for the design magic of the right engineer, the right architect or the right designer to put them to use in stronger, safer and more economical structures.

Designers of buildings and bridges now have a whole "family" of USS Structural Carbon Steels, High Strength Steels and Constructional Alloy Steels available in the necessary shapes with minimum yield points ranging from 32,000 psi to 100,000 psi.

Several bridges and buildings have already been built combining these various steels into one structure to obtain maximum strength, light weight and economy—but all kinds of interesting developments lie ahead. It should be a challenge to designers to get the most out of every steel!

USS United States Steel



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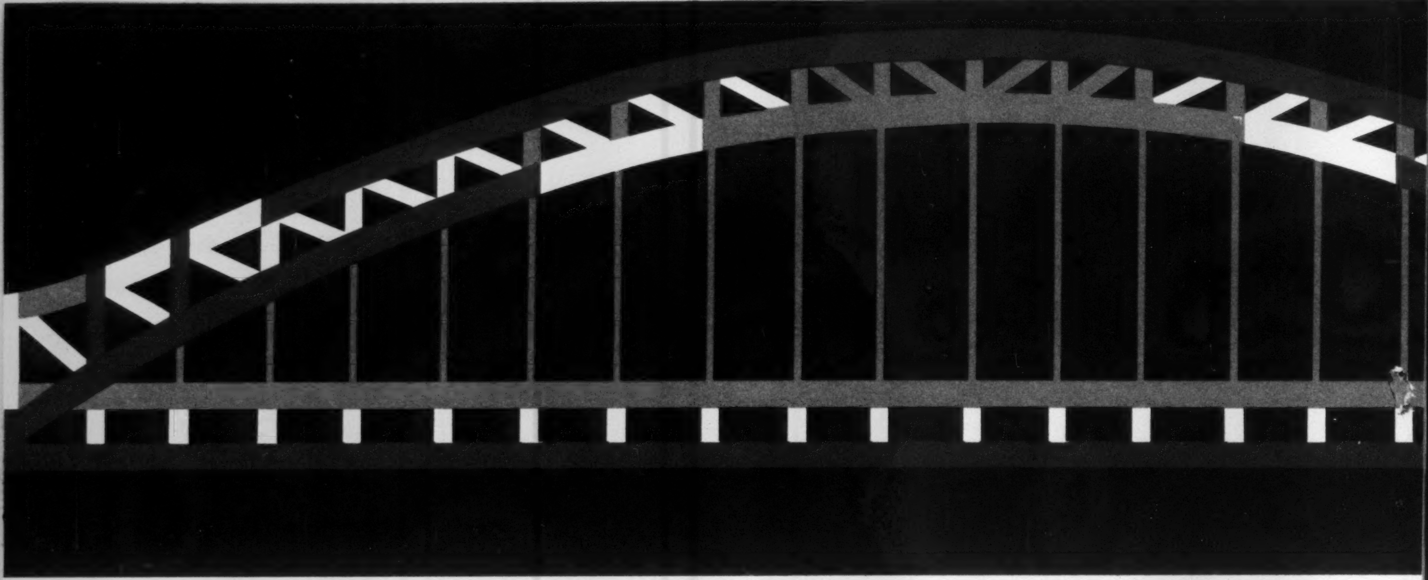
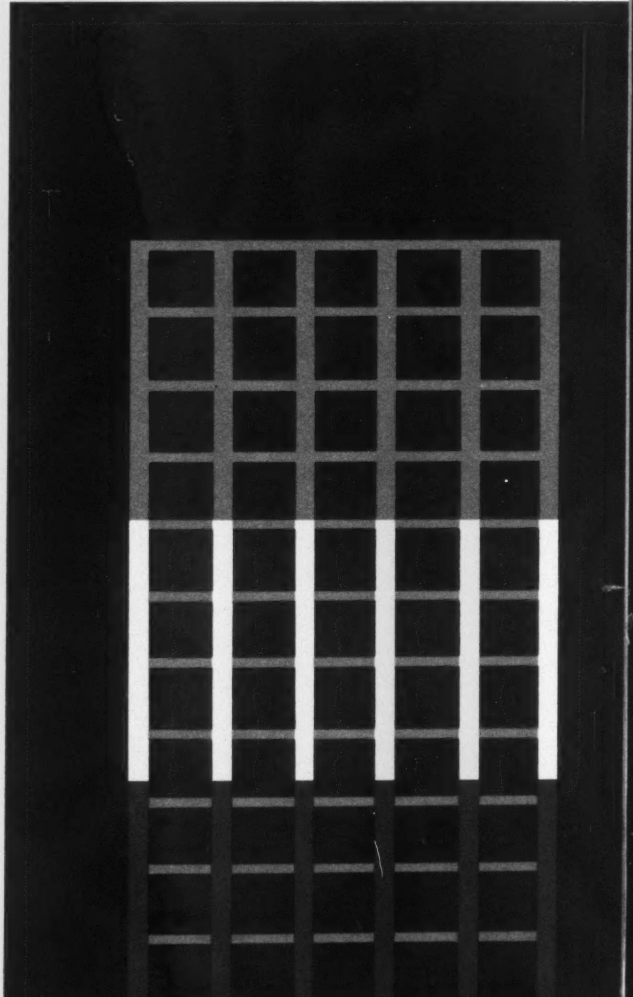
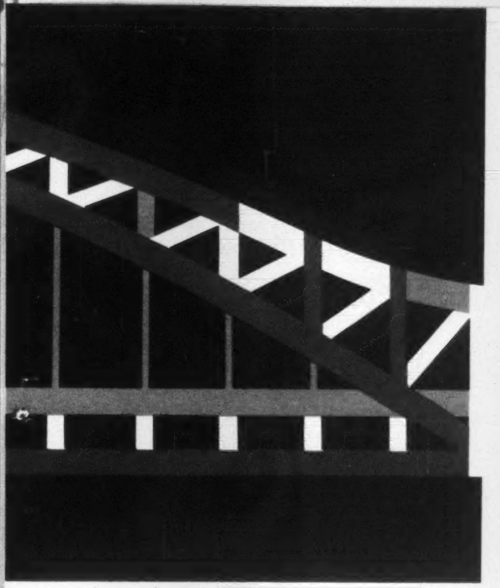


USS Design Steels that do the most to reduce construction costs

New concept of design for buildings and bridges—get the most out of the family of steels by using them wherever they will improve design, reduce weight or effect over-all savings in construction.



This mark tells you a product is made of modern, dependable Steel.



● Red—USS "T-1" Constructional Alloy Steel (100,000 psi minimum yield point)

○ White–USS MAN-TEN High Strength Steel (ASTM A440—50,000 psi minimum yield point)

● Gray—USS Structural Carbon Steel (ASTM A36—36,000 psi minimum yield point or A7—33,000 psi minimum yield point)

Pound for pound, these stronger steels shoulder heavier loads . . . or they reduce the size and weight of structural members and foundations. They add valuable floor space to buildings, reduce freight costs and result in faster erection with earlier occupancy . . . all money-saving advantages.

New design concepts are emerging that challenge the designer's imagination and ingenuity. The combining of many steels to get the most out of them has long been practiced by automotive engineers and some other designers. It has given us the best automobiles, the highest television towers in the world, the largest earth-moving equipment and giant radio telescopes.

ASTM A7 Structural Carbon Steel is a mighty versatile and potent metal. No other material so strong (minimum yield point 33,000 psi) and selling at a material cost of less than 10 cents a pound, can be drawn, welded, forged, riveted, punched, and painted so readily and safely. A more weldable carbon steel (A373) has a minimum yield point of 32,000 psi.

ASTM A36 Structural Carbon Steel. The higher yield point of 36,000 psi and the low price indicate that this important new steel may become the predominant structural grade, and that it may displace A373 in welded construction. A36 steel gives the designer the opportunity to provide lighter-weight structures at a low cost. It has been accepted for both building and bridge construction at a basic allowable design stress 2,000 psi higher than A7 steel (20,000 allowable design stress for bridges, 22,000 for buildings). It can be used for riveted, bolted and welded fabrication.

USS High Strength Steels

All have minimum yield points of 50,000 psi. Each has specific area applications where it will do the very best job.

USS Man-Ten Steel (A440) is a high-strength carbon steel intended for riveted and bolted construction. It is the most economical of the high-strength steels; has good workability, high resistance to abrasion, and atmospheric corrosion resistance double that of plain carbon steel. Since it provides a yield point 50% higher than A7 steel, engineers can design with higher unit working stresses and achieve *real* reductions in steel size, weight and costs.

USS Tri-Ten Steel is a high-strength low-alloy steel intended primarily for use in welded construction. This steel meets all requirements of ASTM A441. It provides greater toughness, even at low temperatures, and has twice the atmospheric corrosion resistance of carbon steel. Tri-Ten Steel has been widely used for bridges, buildings, machinery and railroad equipment to reduce weight and costs or to provide increased strength and load capacity without increased weight.

USS Cor-Ten Steel is recommended for all applications in which relatively high resistance to atmospheric corrosion is considered necessary. It permits the use of thinner sections to take advantage of the increased strength of the material, or the use of equal or heavier thickness for extended life *with or without protective coating.* Paint lasts up to twice as long on Cor-Ten Steel as it does on carbon steel.

USS "T-1" Constructional Alloy Steel. This is the "superman" of structural steels with a minimum yield strength of 100,000 psi. It is furnished quenched and tempered and is readily weldable. It has four to six times the atmospheric corrosion resistance of structural carbon steel and possesses exceptional toughness over a wide range of temperatures down to −50°F. "T-1" Steel combined with USS Tri-Ten High-Strength Low-Alloy Steel and carbon steel has already been used in a number of bridges. In Carquinez Strait Bridge in California, it saved $800,000 with big savings in weight. This led to its use in Martinez Bridge nearby, Louisville-New Albany, Whisky Creek and others under design. "T-1" Steel is available in standard structural shapes as well as bars, semi-finished and sheets.

USS "T-1" type A Constructional Alloy Steel. This is a lower-priced steel with the same high yield strength of 100,000 psi in thicknesses up to 1 inch. It can be used in highly stressed members to obtain maximum strength, with reduced size, weight and costs. It is available in the same shapes as "T-1" Steel.

For more information on any of these USS Steels, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS, "T-1," MAN-TEN, TRI-TEN, and COR-TEN are registered trademarks.

United States Steel Corporation • Columbia-Geneva Steel Division • Tennessee Coal & Iron Division • United States Steel Supply Division • United States Steel Export Company

United States Steel

Now Available...

(USS) QUENCHED AND TEMPERED STRUCTURAL SHAPES

in such grades as "T-1", "T-1" type A, 9% Nickel and HY-80 Constructional Alloy and Armor Steels

Announcing another industry "first" for United States Steel—USS Quenched and Tempered Alloy and Armor Steel Structural Shapes are now commercially available for the first time anywhere, in the types and sizes shown in the accompanying tables. The more commonly used sizes of Wide Flange Beams, American Standard Beams, Channels, Equal Angles and Unequal Angles will be produced in these USS Steels: "T-1", "T-1" type A, 9% Nickel, HY-80 and certain other alloy grades that provide desirable mechanical properties after quenching and tempering. Later, other sizes and shapes will be added according to demand.

These quenched and tempered alloy and armor steel structural shapes (see table below) can simplify design and result in substantial weight savings, increased structural strength and reduced shipping and handling costs. For a free folder about any of these steels or their structural shapes, contact your local USS representative or write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. USS and "T-1" are registered trademarks.

United States Steel Corporation • Columbia-Geneva Steel Division • Tennessee Coal and Iron Division • United States Steel Supply Division • United States Steel Export Company

Availability Quenched and Tempered standard structural shapes are available in the following shapes and sizes:

I	Beams: 8″ to 16″ inclusive	Selected Wide Flange Sections and Foot Weights*
I	Beams: 6″ to 12″ inclusive	American Standard Sections and Foot Weights*
[	Channels: 6″ to 15″ inclusive	American Standard Sections and Foot Weights*
L	Equal Angles: 3″ to 8″ inclusive	Standard Sections*
L	Unequal Angles: 3½″ x 3″ to 8″ x 6″ inclusive	Standard Sections*

*See our booklet, "USS Shapes & Plates," ADUCO-27001

Maximum length 40′ for all sections

Mechanical Properties of Quenched and Tempered Alloy and Armor Steel Structural Shapes

	Yield Strength, psi	Tensile Strength, psi	Elong. in 2″, % min.	Reduction of Area, % min.	Longitudinal Charpy Impact (when specified)	
					Keyhole	V-notch
"T-1" Steel 2½″ and Under	100,000 min.	115,000/140,000	18	55①	15 ft.-lbs. @ −50F	30 ft.-lbs. @ +10F
"T-1" type A 1″ and Under	100,000 min.	115,000/140,000	18	55①	15 ft.-lbs. @ −50F	—
Grade A 9% Nickel	60,000 min.	90,000 min.	22% min.	—	15 ft.-lbs. @ −320F	20 ft.-lbs. @ −320F
Grade B 9% Nickel	65,000 min.	95,000 min.	20% min.			
HY-80 ¼″-2″ Incl.	80,000/100,000②	—	19③	—	—	70 ft.-lbs. @ −120F

①¾″ and under—45% min.
②½″ and over, yield strength range is 80/95,000 psi
③½″ to 2″ inclusive, elongation 20% min.

(USS) **United States Steel**

Costs Roundup—3rd Quarter

Public Housing:

Source : New York State Division of Housing

State Financed Public Housing [a]

Project Name	Location	Stories	Number of . . . Build-ings	Number of . . . Rental Rooms	Rental Rms/Apt (Aver)	Density, Persons Per Acre	Bid Date	Construction Cost Per . . . Rental Room	Construction Cost Per . . . Cubic Foot
New York City									
Hamilton, I	Manhattan	21	2	2,501	5.2	708	11/22/60	$2,663	$1.22
II	Manhattan	21	3	3,261.5	4.4	708	11/22/60	2,663	1.22
Borgia Butler, I	Manhattan	21	4	4,783	4.8	565	1/17/61	2,433	1.22
II	Manhattan	21	2	2,501	5.2	565	1/17/61	2,433	1.22
Rutgers	Manhattan	20	5	3,294.5	4.6	543	4/17/61	2,541	1.26
Baychester	Bronx	4, 6	13	1,866.5	4.2	280	6/20/61	3,268	1.50
Outside New York City									
No name (NYS 106)	Greenburgh b	1, 2, 3	10	631.5	4.8	78	10/11/60	2,385	11/1.01

a updates 1960 report (ENR 9/22/60, p 82)   b rowhouse, without basement (crawl space)

State Financed Limited Profit Housing

Project Name	Location	Stories	Number of . . . Build-ings	Number of . . . Rental Rooms	Rental Rms/Apt (Aver)	Density, Persons Per Acre	Bid Date	Construction Cost Per . . . Rental Room	Construction Cost Per . . . Cubic Foot
Multi-Story Fireproof Construction									
Park Reservoir Apts	New York (Bronx)	13	3	1,227.7	4.5	387	10/27/56	$2,698	$1.01
Parkside Apts	New York (Bronx)	14	1	736	4.8	611	6/18/57	3,143	1.14
Jimerson Apts	New York (Bklyn)	14	3	2,044	4.9	260	6/18/57	2,807	1.26
Woodlawn Apts	New York (Bronx)	9	1	477	4.8	442	6/19/57	3,230	1.18
Mutual Apts	New York (Bklyn)	16	1	795.5	5.0	540	8/ 8/57	2,642	1.31
Inwood Terrace	New York (Man)	21	1	902	4.4	267	8/ 4/58	2,966	1.24
Sunset Green	Yonkers	9	1	347.5	5.0	347	4/10/59	3,414	1.36
Inwood Heights	New York (Man)	21	1	909	4.4	387	7/31/59	2,892	1.26
Tower Gardens	New York (Bronx)	14	2	962	4.6	386	2/29/60	3,349	1.34
Ebbets Field Houses	New York (Bklyn)	22, 25	1	5,995	4.5	672	9/13/60	3,024	1.34
Tower Apts	Buffalo	13	1	381	4.2	820	9/14/60	3,401	1.51
Washbridge	New York (Man)	32	4	5,040	5.3	1,007	5/18/61	3,115	1.33
Multi-Story Non-Fireproof Construction c									
Nordeck Apts	New York (Queens)	6	6	1,527	4.5	195	8/ 8/59	2,744	1.02
Row Houses-Fireproof									
Cobbs Hill Apts	Rochester	1	6	180	3.0	9	2/25/57	2,945	1.06
Seth Green Park	Rochester	2	5	219.5	2.9	29	10/ 1/58	2,945	1.39
Row Houses Non-Fireproof d									
Love-Weichmann	Buffalo	2	7	604	4.9	71	5/29/57	2,751	1.23
Hertel Homes	Buffalo	2	9	727	4.6	59	7/ 1/57	3,072	0.99
Ballantyne Gardens	Syracuse	3	4	564	4.7	110	9/14/60	3,482	1.24
Multi-Story Fire Resistive Construction									
Park Regent Apts	Port Chester	7	2	423	4.7	121	7/20/59	3,155	1.20

c wall bearing, woodjoist floors   d 2 & 3 stories

Housing Prices Rise in New York

Prices for new state-aided public housing in New York City rose in the first half of 1961. The range for four developments is from $1.22 to $1.50 a cu ft, compared with $1.25 and $1.33 for two projects let in the first half of 1960 (ENR Sept. 22, 1960, p. 82).

The average cube cost in 1961 is $1.30 compared with $1.29 for January to June 1960, and $1.25 a cu ft for four New York City Developments awarded Jan. to Dec. 1960.

No public housing was let outside New York City in the first half of 1961.

The limited-profit housing program boasts 13 completed projects as of March 1961; four more are under construction, and 23 in the planning stage. These 40 middle-income projects add a total of 17,222 dwelling units and account for $192,277,400 in mortgage loans, committed or reserved.

Look for these figures to increase with the state's 1960 creation of the Housing Finance Agency. Aimed at boosting the state-wide middle-income housing program, the agency is ready to provide $525 million in low-interest mortgage loans to sponsors of limited-profit housing developments.

Prices for limited-profit housing have increased from $1.01 a cu ft (for one project awarded in 1956) to $1.33 for one development awarded in the first half of 1961. Average cu ft costs since 1956 are: $1.17 for seven awards in 1957; $1.32 for two buildings let in 1958; $1.21 for four in 1959; and $1.36 for four projects in 1960.

One project awarded in January to June 1960 cost $1.34 a cu ft, compared with $1.33 a cu ft recorded in the first half of 1961. Both buildings are multistory fireproof construction.

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Skyscraper Cost Components

New York City continues to ride an unprecedented boom in office building construction. Whole city blocks crumble to the wrecker's swinging ball. Obsolete skyscrapers give way to higher and glossier structures as do many ancient substandard business and residential slum buildings.

Up in the forefront of this massive municipal renovation activity is Carl A. Morse, President of Diesel Construction Co. of New York. Mr. Morse is his own walking, instant computer and storage system of building costs, unit by unit, as well as by major components. His "print-outs" on where the skyscraper dollars go, shown in the accompanying tables, illustrate the effects on costs of height of buildings.

He has also updated the unit costs of materials and types of work published in ENR, Oct. 8, 1953, p. 162, to show what time and the continuing building boom have done to them.

As buildings go higher the ratios to total cost of some components go up, others go down.

- Structural steel leads the up side. It takes 10% of a 23-story building's budget, 19.6% of a 60-story building's.
- Air conditioning leads the down side. It takes 18.7% of the cost of a 23-story building but only 15.5% of a 60-story building budget.
- Elevator cost ratios go up less with aded height than one would expect, from 10.9% of the 23-story costs to 12.2% for the 60-story building.
- The electrical work and fixtures also take a big bite of skyscraper dollars—11.3% for the 23-story, 12.6% for the 35-story and 12.2% for the 60-story building.
- Mixed effects or no pattern also characterize excavation and foundations, masonry including partitions, ornamental metal and spandrel waterproofing and insulation.
- No effect on their cost ratios of added height are enjoyed by floor covering, mail chutes, miscellaneous iron and steel and tile work.
- Rising cost ratios with increased height include marble and granite, steel sash and erection, terrazzo, and insurance.
- The declining cost ratios include ceilings, skin, carpentry, concrete slabs, doors and frames, glazing, hardware, furring and plaster, toilet partitions, painting, plumbing, roofing and sheet metal, ventian blinds, general labor and supervisory, general conditions and contractor's fee.
- The ratio of rentable to gross space also declines with additional height. At 23 stories the ratio is 88.7%, at 35 stories—89.5%. But at 60 stories, the ratio drops to 81.8%.

The impact of unit prices on the cost of big buildings can be judged by the bill of materials for a 60-story skyscraper—44,250 tons of structural steel, 65,000 sq ft of aluminum skin, 460,000 sq yd of plaster, 3,500,000 sq ft of masonry, 1,700,000 sq ft of cellular floor, 2,280,000 sq ft of composition flooring, 8,000 windows, 340,000 sq ft of glass, 302,000 sq ft of venetian blinds, 160,000 sq ft of ceramic tile, 42,000 light fixtures, 3,000 plumbing fixtures, and 25,000 sq ft of terrazzo.

Multiply these by their unit prices and their impact is impressive. Steel ranges from $260 to $330 per ton (compared with $250-$310 in 1953). Glass runs from $0.60 to $0.70 per sq ft (up from $0.45 to $0.55 in 1953) for double thick, furnished and installed. But double plate runs $1.00 to $1.10 compared with $0.85 to $1.10 in 1953. Aluminum exterior, including sash, ranges from $4.50 to $8.00, a drop from the 1953 range of from $7.00 to $10.00 a sq ft.

Metal venetian blinds at $0.30 to $0.40 a sq ft are up from the 1953 range of $0.25 to $0.30, while light fixtures have held to their 1953 price of $22.00 to $30.00 for 3-light 40-watt flourescent, and $27.50 to $45.00 ea for recessed 3-light 40-watt flourescent.

Plumbing ranges from $225 to $280 a fixture, up from $190 to $265 in 1953. Terrazzo flooring, furnished and installed, held at the 1953 price range of $1.15 to $1.35 a sq ft, while ceramic tile flooring increased to a 1961 range of $1.25 to $1.30 a sq ft, compared with $0.90 to $1.15 in 1953.

Flooring materials held the line with the exception of ceramic and quarry tile (expansion joint). Quarry tile, at a range of $0.90 to $1.15, is up from $0.75 to $0.85 a sf in 1953. Steady at 1953 prices, cork tile (⅛ in.) held

What You Pay for Building Height

and where the money goes

Major Components	% of total cost 23 story	 35 story	 60 story
Acoustical ceilings	3.5	3.5	2.9
Air conditioning	18.7	16.9	15.5
Skin	6.0	6.0	4.0
Carpentry	0.6	0.6	0.4
Structural steel	10.0	13.0	19.6
Concrete slabs	8.2	8.0	7.6
Composition floor covering	1.0	1.0	1.0
Doors and frames	0.7	0.7	0.5
Electric including fixtures	11.3	12.6	12.2
Elevators	10.9	11.9	12.2
Excavation and foundations	3.5	2.6	3.6
Glazing	1.7	1.0	0.7
Hardware	0.3	0.3	0.2
Furring and plaster	2.0	2.0	1.6
Mail chute	0.05	0.05	0.05
Marble and granite	0.6	0.7	1.0
Masonry including partitions	4.7	5.3	4.0
Toilet partitions	0.3	0.2	0.2
Miscellaneous iron and stairs	0.8	0.8	0.8
Ornamental metal	1.6	0.9	1.1
Steel sash and erection	0.06	0.05	1.1
Painting	0.8	0.8	0.6
Plumbing	3.5	2.9	2.3
Roofing and sheet metal	0.8	0.6	0.5
Spandrel waterproofing and insulation	0.06	0.02	0.05
Terrazzo	0.03	0.08	0.1
Tile work	0.6	0.6	0.6
Venetian blinds	0.2	0.1	0.1
Miscellaneous contracts	0.2	0.2	0.5
General labor and supervisory	2.2	2.1	1.6
Insurance	0.5	0.5	0.7
General conditions	1.9	1.6	1.2
Contractor's fee	2.7	2.4	1.5
Total	100.0	100.00	100.00
Gross floor area in square feet	371,000	670,000	2,800,000
Net rental space in square feet	329,000	600,000	2,290,000
Ratio of rentable to gross space	88.7%	89.5%	81.8%

in New York City

at $0.45 to $0.54, oak parquet at $0.50 to $0.60 a sq ft, rubber tile (⅛ in.) at $0.40 to $0.45, ⅛ in. asphalt tile at $0.14 to $0.18 a sq ft, and ⅛ in. battleship linoleum at $0.30 to $0.35 a sq ft.

Comparing 1961 and 1953 prices for these 88 cost items, 46 items have stayed with the 1953 price range, 40 have increased, and two have gone down.

On the rising costs side, concrete at $16.75 to $17.50 a cu yd for 3,000 lb test ready-mix (furnish only) is up from a 1953 range of $12.50 to $13.50. And 2,500 lb no test (furnish only) runs from $16.15 to $16.90 a cu yd (up from $12.00 to $12.50 in 1953). Similarly, foundation concrete (piers, footings and walls) pushed up to a 1961 range of $23.60 to $26.00, compared with $22.00 to $24.00 a cu yd in 1953.

Air conditioning prices are also up, ranging from $1,100 to $1,250 a ton, compared with $1,000 to $1,100 in 1953. Heating prices remained steady, however, at a range of $3.75 to $4.75 per sq ft of radiation.

City excavation prices held to their 1953 ranges of $2.70 to $3.00 a cu yd for earth excavation and $7.75 to $9.00 a yard for rock. But earth excavation at $1.40 to $1.90 in 1961, is up from $1.25 to $1.75 a yard in 1953.

Insulation and waterproofing prices are also riding the upswing. Foamglas insulation (hot pitch, 2 in.) ranges from $0.35 to $0.40 a sq ft compared with $0.30 to $0.35 in 1953. Fiberglas (hot pitch, 1 in.) runs from $0.25 to $0.30 a sq ft, up from a 1953 range of $0.20 to $0.25 a sq ft. Waterproofing rose to a range of from $0.20 to $0.23 a sq ft for 5-ply felt (no slag), up from a range of $0.18 to $0.20 a ft in 1953, and 5-ply felt (slag) moved up to a range of $0.24 to $0.26 a sq ft from $0.22 to $0.24 a sq ft in 1953.

Sheet metal duct work prices range from $0.60 to $1.25 a lb, compared with $0.58 to $0.76 a lb in 1953. And stairs (iron pan construction) prices run from $375 to $475 per floor, up from a range of $275 to $350 a floor eight years ago.

Electric held steady at 1953 prices of $0.50 to $0.75 a sq ft for the whole building, and $20.00 to $30.00 for each additional outlet.

Only aluminum exterior, including sash, and ceramic tile walls declined in price. Ceramic tile walls at $1.25 to $1.75 a sq ft are down from the 1953 range of $1.40 to $1.75 a sq ft.

Materials Required for 60-story Skyscraper

Items	Unit	Quantity
Aluminum skin	sf	65,000
Mosaic, precast walls	sf	550,000
Acoustic tile ceilings	sf	2,280,000
Cellular floor	sf	1,700,000
Composition flooring	sf	2,280,000
Elevators	ea	65
Escalators	ea	20
Furring and lathing	sy	30,000
Plaster	sy	460,000
Glass	sf	340,000
Peripheral enclosures	lf	47,000
Light fixtures	ea	42,000
Marble and granite	sf	75,000
Masonry	sf	3,500,000
Metal partitions	lf	40,000
Toilet partitions	ea	1,300
Windows	ea	8,000
Terrazzo	sf	25,000
Mosaic tile	sf	20,000
Ceramic tile	sf	160,000
Venetian blinds	sf	302,000
Plumbing fixtures	ea	3,000
Roofing	sf	123,000
Structural steel	t	44,250

How Unit Costs of Office and Apartment Buildings Vary in New York

By material and type of work . . . in 8 years of active building

Items	Unit	Unit price range	
		1953	1961
Wrecking & removing group of four 5-story buildings, 25 x 100 ft ea	group	$16,000–20,000	$17,000–22,000
Rubbish removal	cy	1.30– 1.80	1.60– 2.00
Earth excavation, city	cy	2.70– 3.00	no change
Rock excavation, city	cy	7.75– 9.00	no change
Earth excavation, open areas	cy	1.25– 1.75	1.40– 1.90
Pile driving, 12 & 14" steel H's, F&I	per ft	9.00–13.00	no change
tapered concrete to 18', F&I	per ft	5.75– 7.00	no change
tapered concrete more than 18', F&I	per ft	7.75– 9.50	no change
Foundation reinforcing, F&I	per ton	260–320	275–340
Foundation forms, piers, face side, F&I	sf	0.60– 0.75	0.75– 0.85
walls, face side, F&I	sf	0.75– 0.90	0.80– 0.95
Foundation concrete, piers, footings, F&I	cy	20.00–22.00	22.00–23.50
walls, F&I	cy	22.00–24.00	23.50–26.00
Ready-mix concrete, 3000 lb test, F only	cy	12.50–13.50	16.75–17.50
Ready-mix concrete, 2500 lb no test, F only	cy	12.00–12.50	16.15–16.90
Concrete arches, 4" cinder concrete, F&I	sf	1.10– 1.25	1.20– 1.40
4" gritcrete, F&I	sf	1.20– 1.35	1.30– 1.50
lightweight concrete, F&I	sf	1.30– 1.45	1.40– 1.60
Finish cement, 1" & steel trowel, F&I	sf	0.18– 0.23	0.20– 0.25
Reinforced concrete structure, F&I	sf	2.35– 2.75	2.40– 3.00
Steel structure, F&I	per ton	250–295	260–295
steel joists, F&I	per ton	285–310	295–330
Exterior brick, F&I	per 1,000	175–225	195–240
Aluminum exterior, with sash, F&I	sf	7.00–10.00	4.50– 8.00
Granite facing, 1" & 2" thick, F&I	sf	9.00–13.00	no change
Cast stone copings, trim, F&I	cf	7.00	no change
Interior masonry, 3" gyp block, F&I	sf	0.40– 0.48	0.42– 0.50
ceramic tile walls, F&I	sf	1.40– 1.75	1.25– 1.75
ceramic tile floors, F&I	sf	0.90– 1.15	1.25– 1.30
structural facing tile, one side, F&I	sf	1.60– 2.00	1.75– 2.25
6" cinder back-up block, F&I	sf	0.55– 0.65	0.60– 0.70
Plastering, two coats on masonry, F&I	sy	1.80– 2.00	1.90– 2.30
three coats on lath, F&I	sy	2.00– 2.30	2.25– 2.65
Lathing metal hung ceiling, F&I	sy	3.25– 3.50	3.60– 3.90
Flat metal hung rock lath ceiling, F&I	sy	3.60– 4.25	no change
vertical metal wall furring, F&I	sy	3.30– 3.50	3.00– 3.90
Acoustical tile ceilings, F&I	sf	0.43– 0.54	0.45– 0.58
Carpentry, doors and bucks, 1 only	per opening	11.00–15.00	no change
trim, lumber, F only	per rm	40.00–70.00	no change
metal kitchen cabs, F only	per apt	150–200	no change
trim, rough and finish, FP, I only	per rm	75.00–85.00	no change
trim, rough & finish, non-FP, I only	per rm	115–135	no change
Flashing, copper, F&I	per ft	1.50– 2.00	no change
through copper, F&I	per ft	2.50	no change
Insulation, 2" Foamglas, hot pitch, F&I	sf	0.30– 0.35	0.35– 0.40
1" Fiberglas, hot pitch, F&I	sf	0.20– 0.25	0.25– 0.30
Waterproofing, 5-ply felt, no slag, F&I	sf	0.18– 0.20	0.20– 0.23
5-ply felt, slag, F&I	sf	0.22– 0.24	0.24– 0.26
Marble Wainscot, F&I	sf	4.00– 6.50	no change
Floors, cork tile, 5/16", F&I	sf	0.45– 0.54	no change
oak parquet, F&I	sf	0.50– 0.60	no change
terrazo, F&I	sf	1.15– 1.35	no change
quarry tile, expansion joint, F&I	sf	0.75– 0.85	0.90– 1.15
rubber tile, ⅛", F&I	sf	0.40– 0.45	no change
asphalt tile, ⅛", F&I	sf	0.14– 0.18	no change
linoleum, battleship ⅛", F&I	sf	0.30– 0.35	no change
Heating, F&I	sf radiation	3.75– 4.75	no change
Sprinkler, F&I	per head	32.50–42.50	no change
Plumbing, F&I	per fixture	190–265	225–280
Ductwork, sheet metal, F&I	per lb	0.58– 0.76	0.60– 1.25
Louvers, galvanized, F&I	sf	2.50– 3.00	no change
aluminum, F&I	sf	6.00 8.00	no change
Airconditioning, F&I	per ton	1,000–1,100	1,000–1,250
Doors, hollow metal, no hrdwr, F only	ea	32.00–50.00	no change
kalamein, no hrdwr, F only	ea	23.00–28.00	no change
wood, non-FP, no hrdwr, F only	ea	8.00–14.00	no change
wood, FP, no hrdwr, F only	ea	32.00–43.50	no change
rolling, overhead, with mech, F&I	sf	4.50– 6.00	no change
bucks, metal, F only	ea	6.50– 8.50	no change
Window sash, DH, steel & alum, F only	sf opening	2.00– 2.50	no change
casement, steel resident, F only	sf opening	0.60– 0.75	no change
casement, intermediate, F only	sf opening	0.75– 0.90	no change
Glass, double thick, F&I	sf	0.45– 0.55	0.60– 0.70
double plate, F&I	sf	0.85– 1.10	1.00– 1.10
Electric, whole building	sf	0.50– 0.75	no change
additional	per outlet	20.00–30.00	no change
Light fixtures, surface mounted, 3-Light 40-watt fluorescent, F&I	ea	22.00–30.00	no change
recessed, 3-light, 40-watt, fluorescent, F&I	ea	27.50–45.00	no change
Elevators, automatic 6-story, apt F&I	ea	11,500–13,500	no change
automatic 15-story, apt, F&I	ea	35,000–40,000	no change
automatic 15-story, commercial, F&I	ea	55,000–65,000	no change
Stairs, iron pan construction, per fl, F&I	ea	275–350	375–475
Mailchute, 15 to 18-story, F&I	ea	3,000	no change
25 to 30-story, F&I	ea	5,500	no change
Paint 3 coats, F&I	sf	0.06	0.07½
Paper, F&I	per roll	2.25– 4.60	no change
lining, F&I	per roll	1.15	no change
Venetian blinds, metal, F&I	sf opening	0.25– 0.30	0.30– 0.40

F&I furnish & install (all items except as noted); F furnish; FP fireproof Unit Prices include the contractors plant on the site (i.e. scaffolding, mortar mixing machines, etc.)

The Impact of School Construction on

School construction expenditures are not all outgo, they are major income for the skilled building trades, for a broad range of general and subcontractors and materials and equipment suppliers. This economic impact of school construction is measured both in actual manhours of employment and in the dollars that go to each of the nation's major businesses, in a special study of 128 schools by the Bureau of Labor Statistics Division of Productivity and Technological Development. Some of the highspots in this report include:

- **A comparison of school construction costs pin-pointing the higher cost of big-city classrooms**—About 55% of the schools studied are in metropolitan areas. Larger, and more expensive in total cost, they also have higher sq ft and classroom costs than nonmetropolitan schools. Sq ft prices average $14.68 for metropolitan schools, compared with $13.11 for nonmetropolitan, and classrooms, $37,500 compared with $30,500.

The densely populated Northeast boosted the national average by racking up the highest prices in the country, averaging $17.58 a sq ft for city schools and $16.10 for non-city. This counteracts the South's low of $12.73 and $10.67.

Classrooms Cost from $15,000 to $61,300—cost varies with school size and location

Prices effective July 1958—June 1959 (ENR Building Cost Index 524-551)

Characteristic	United States			Northeast			North Central			South			West		
	No.	Cost per Square foot	Cost per Classroom (thousands)	No.	Cost per Square foot	Cost per Classroom (thousands)	No.	Cost per Square foot	Cost per Classroom (thousands)	No.	Cost per Square foot	Cost per Classroom (thousands)	No.	Cost per Square foot	Cost per Classroom (thousands)
All schools	**128**	**$14.16**	**$35.0**	**22**	**$16.99**	**$42.7**	**26**	**$13.67**	**$35.1**	**41**	**$12.11**	**$26.1**	**39**	**$14.25**	**$38.4**
Elementary	85	13.26	24.8	13	17.02	32.4	18	14.27	27.1	29	10.67	19.1	25	13.40	26.3
Secondary	43	14.67	44.3	9	16.97	50.2	8	13.35	42.3	12	13.49	36.4	14	14.61	46.8
In a metropolitan area	70	14.68	37.5	10	17.58	47.1	13	14.15	38.6	22	12.73	29.3	25	14.86	38.9
Not in a metropolitan area	58	13.11	30.5	12	16.01	36.6	13	12.74	29.4	19	10.67	20.2	14	12.97	37.3
Construction cost group (in thousands):															
$200 and under	22	11.57	19.9	1	a	a	5	12.76	23.0	9	9.97	17.2	7	13.01	23.3
$201-$300	16	10.60	20.0	1	a	a	4	12.46	25.6	7	9.13	15.5	4	11.62	25.6
$301-$400	24	12.15	23.2	4	15.02	29.4	4	13.77	28.4	10	11.02	20.4	6	11.66	22.1
$401-$500	15	12.08	23.6	1	a	a	3	13.56	32.1	5	9.96	17.4	6	13.52	27.3
$501-$1,000	24	14.77	30.2	7	17.19	33.1	5	14.31	29.1	5	12.40	24.4	7	14.86	33.7
$1,001-$2,000	17	13.89	41.7	5	15.45	40.9	3	13.01	43.3	4	13.85	42.3	5	13.14	40.8
$2,001 and over	10	16.48	56.3	3	18.88	61.3	2	a	a	1	a	a	4	15.86	56.8
Type of framing:															
Steel	51	14.77	38.7	14	16.98	45.4	12	13.12	34.7	17	12.41	27.7	8	15.84	49.5
Concrete	29	13.65	32.5	1	a	a	6	14.80	42.5	14	12.60	25.8	8	13.07	32.1
Load-bearing masonry	28	12.81	27.1	7	16.54	29.6	8	13.79	27.7	10	10.14	22.6	3	11.42	29.1
Wood	20	14.24	36.6	..	.....	.....	..	.....	.....	..	.....	.....	20	14.25	36.6
1 story	101	13.13	29.1	13	15.72	35.9	20	13.75	31.9	33	10.97	21.4	35	13.63	32.7
2 or 3 stories	27	15.53	45.3	9	17.74	47.5	6	13.61	38.5	8	14.25	38.5	4	15.72	60.0
Full or partial basement	27	15.81	45.0	12	17.90	47.2	9	14.43	40.3	4	12.65	36.4	2	a	a
No basement	101	13.42	31.3	10	15.20	35.1	17	13.09	31.7	37	12.01	24.8	37	14.20	36.5
Exterior:															
Masonry	105	14.09	34.5	21	17.01	43.2	26	13.67	35.1	36	12.31	26.7	22	13.37	35.6
Curtain wall	11	14.84	35.2	1	a	a	..	......	......	5	10.64	22.0	5	17.25	46.3
Other	12	14.15	39.3	..	.....	.....	..	......	.....	..	.....	.....	12	14.15	39.3

a insufficient data to warrant presentation.

On-Site Manhours of Labor for School Construction Averages 2,938 per Classroom

Characteristic	United States			Northeast			North Central			South			West		
	Man-hours per $1,000 of cost	Man-hours per 1,000 square feet	Man-hours per Class-room	Man-hours per $1,000 of cost	Man-hours per 1,000 square feet	Man-hours per Class-room	Man-hours per $1,000 of cost	Man-hours per 1,000 square feet	Man-hours per Class-room	Man-hours per $1,000 of cost	Man-hours per 1,000 square feet	Man-hours per Class-room	Man-hours per $1,000 of cost	Man-hours per 1,000 square feet	Man-hours per Class-room
All schools	**84.0**	**1,189**	**2,938**	**76.0**	**1,291**	**3,249**	**82.6**	**1,129**	**2,902**	**99.0**	**1,199**	**2,587**	**80.6**	**1,149**	**3,099**
Elementary	86.7	1,150	2,153	83.3	1,417	2,697	78.9	1,126	2,136	105.1	1,122	2,006	75.6	1,013	1,986
Secondary	82.6	1,212	3,656	72.6	1,233	3,646	84.7	1,131	3,586	94.3	1,272	3,427	82.6	1,206	3,864
In a metropolitan area	82.6	1,212	3,092	74.4	1,307	3,499	77.9	1,102	3,007	94.9	1,208	2,778	82.1	1,220	3,197
Not in a metropolitan area	87.2	1,144	2,656	79.0	1,266	2,894	92.9	1,184	2,727	110.3	1,177	2,224	77.1	1,001	2,874
Construction cost group (in thousands):															
$200 and under	90.0	1,041	1,787	a	a	a	98.4	1,256	2,260	96.1	958	1,650	77.7	1,012	1,812
$201-$300	92.0	974	1,842	a	a	a	90.8	1,131	2,322	98.6	901	1,526	79.0	918	2,024
$301-$400	95.6	1,161	2,214	84.2	1,265	2,476	78.9	1,087	2,238	116.7	1,286	2,380	80.5	939	1,780
$401-$500	85.8	1,037	2,029	a	a	a	93.3	1,264	2,991	96.7	963	1,678	75.4	1,019	2,059
$501-$1,000	81.2	1,199	2,449	79.1	1,359	2,619	76.7	1,097	2,231	103.1	1,278	2,512	70.6	1,048	2,376
$1,001-$2,000	82.2	1,142	3,427	74.5	1,151	3,047	83.7	1,089	3,623	92.6	1,282	3,914	79.2	1,040	3,233
$2,001 and over	81.7	1,347	4,604	73.6	1,389	4,515	a	a	a	a	a	a	86.6	1,374	4,916
Type of framing:															
Steel	83.5	1,233	3,230	74.0	1,256	3,354	87.5	1,148	3,033	96.3	1,195	2,670	84.2	1,335	4,172
Concrete	88.6	1,209	2,876	a	a	a	72.5	1,073	3,081	101.5	1,278	2,621	79.5	1,038	2,548
Load-bearing masonry	81.6	1,046	2,212	74.7	1,235	2,208	84.0	1,158	2,328	100.2	1,016	2,270	68.6	783	1,999
Wood	80.5	1,146	2,949	....	.....	.....	....	.....	.....	....	.....	.....	80.5	1,146	2,949
1 story	85.0	1,116	2,474	78.4	1,232	2,811	83.8	1,152	2,670	102.5	1,124	2,191	77.5	1,056	2,536
2 or 3 stories	82.8	1,287	3,750	74.8	1,326	3,551	81.6	1,111	3,140	93.9	1,338	3,612	87.2	1,371	5,229
Full or partial basement	82.5	1,304	3,707	78.2	1,399	3,690	80.7	1,164	3,254	108.6	1,374	3,950	a	a	a
No basement	84.8	1,138	2,653	71.0	1,079	2,490	84.3	1,103	2,668	97.1	1,166	2,405	80.5	1,143	2,941
Exterior:															
Masonry	83.2	1,172	2,870	76.0	1,293	3,283	82.6	1,129	2,902	98.3	1,211	2,629	76.1	1,018	2,705
Curtain wall	92.9	1,379	3,272	73.7	1,167	1,917	....	.....	.....	104.2	1,109	2,293	89.9	1,552	4,165
Other	82.1	1,163	3,230	....	.....	.....	....	.....	.....	....	.....	.....	82.1	1,163	3,230

a insufficient data to warrant presentation.

Employment and Business

Costs Roundup—3rd Quarter

Over 80% of the schools surveyed chose single-story construction without basement. This brings the average price down to $13.13 a sq ft compared with $15.53 for 2-story or 3-story schools, and shaves $1.38 off the $15.81 national average for schools with full or partial basements.

Steel framing, at $14.77 a sq ft, was picked by 40% of the schools, and wood, at $14.24 a sq ft, by 15% (all in the west). The remainder, 45%, divided evenly between reinforced concrete and load-bearing masonry.

• **Total manhours spent on school construction, and the shifting emphasis from on-site to off-site labor**—Wages are pushing up, but the amount of labor needed for on-site school construction has cut back ¼ in the last 20 years, according to the BLS survey. Greater use of prefabricated units, increased efficiency, changing school design, have all nudged workmen out of on-site labor and into the areas that manufacture and deliver construction materials.

The "average school" in the study costs $730,000, takes a year to build, and gives a year's work to 81 people—38 in direct construction, and 43 in furnishing equipment, materials, and supplies. For every $1,000 invested in U.S. schools, 84 manhours are spent in on-site employment and 128 in off-site labor. Manufacturing trades naturally take the biggest chunk out of the off-site figure, accounting for 78 manhours, or 37% of total.

Deviations from the average on-site requirements are largely regional. Fewer manhours are recorded in the Northeast, where mechanical equipment and skilled workers reduce labor volume, and highest in the South, where unskilled labor is the major construction commodity. For example, manhours involved in steel framing, the most popular type in both Northeast and South, total 74 for every $1,000 of framing in the Northeast, and 96.3 manhours in the South.

• **The impact of size on school construction time**—Although the average U. S. school took a year to build, individual groups of schools had time spans ranging from several months for smaller jobs to almost 2 years for some of the big ones. There were also regional differences in completion time. The average construction job in the Northeast took 68 weeks and the average job in the South, 47 weeks.

• **The number of contractors who work on a school**—It took an average of 19 contractors to complete a public school contract in this 1959 survey. This ranges from an average low of 15 subcontractors in the South to an average high of 25 in the Northeast, where greater construction specialization seems to be the rule.

The general contractor requires most labor, averaging of 47.7% of on-site manhours. The range is from 52.1% in the North Central region to 43.5% in the Northeast.

• **Wages share of school contract dollars**—Wages account for an average of 25.7% of the U. S. school building dollar. They range from a low of 24% in the Northeast to 26.9% in the South. Hourly earnings averages moved down from the Northeast's average of $3.32/hr to the South's low of $2.62.

• **Materials share of school dollars**—An average of $555 out of every $1,000 of school contract goes for materials. Variations are small. Only 18% of the $555 goes for transportation, warehousing and trade industries, leaving 82% to be absorbed by the actual items.

Kinds of material used varied regionally. The major difference was in more wood, less clay products in the West

(Continued on page 110)

On-Site Labor Is Only 39% Of Total to Build Schools

	Man-hours/$1,000 of contract No.	%
Total man-hours	212	100
Construction:		
On-site	84	39
Off-site	10	4
Manufacturing	78	37
Transportation	8	4
Trade and service	20	9
Other industry employment	12	6

To Build a School Takes From 25 to 98 Weeks

Cost group (in thousands)	United States	North-east	North Central	South	West
	Weeks	Weeks	Weeks	Weeks	Weeks
All groups	53	68	55	47	51
$100 and under	31	..	41	25	a
$101-$200	37	a	50	37	29
$201-$300	43	a	49	37	40
$301-$400	47	47	44	50	43
$401-$500	50	a	59	43	51
$501-$1,000	56	60	61	53	51
$1,001-$2,000	76	83	73	76	72
$2,001 and over	84	98	a	a	86

a insufficient data to warrant presentation.

From 9 to 33 Contractors Work on a School

Cost group (in thousands)	United States	North-east	North Central	South	West
All groups	19	25	18	15	21
$200 and under	12	b	9	10	15
$201-$300	12	b	15	11	12
$301-$400	18	21	22	14	20
$401-$500	16	b	15	13	19
$501-$1,000	22	25	19	19	23
$1,001-$2,000	29	28	30	32	26
$2,001 and over	33	32	b	b	37

b insufficient data to warrant presentation

On-Site Labor Is Hired By These Types of Contractors

Type of contractor	United States	North-east	North Central	South	Wes
All types	100.0	100.0	100.0	100.0	100.0
General	47.4	43.5	52.1	48.5	46.5
Electrical	7.5	7.6	7.8	5.9	8.8
Masonry	7.2	10.8	2.1	10.5	4.2
Painting	3.5	4.7	3.5	2.6	3.8
Plastering and lathing	3.2	0.5	2.3	3.3	4.8
Plumbing and heating	14.2	10.9	18.4	13.5	14.9
Roofing and sheet metal	2.4	2.2	3.1	2.7	2.1
Site preparation and excavation	2.4	4.9	1.5	1.2	2.5
Structural and ornamental metal	3.2	2.8	3.3	3.4	3.1
Tile and terrazzo work	2.0	2.8	0.7	2.5	1.5
All other types	7.1	9.2	5.3	6.0	7.7

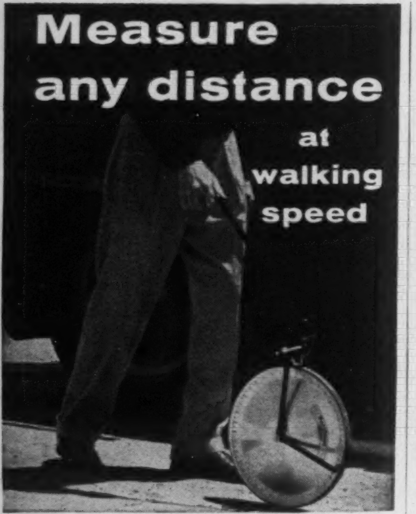
c based on data from federally aided school projects only.

Wages Average 25.7% of the School Contract Dollar

On-site hourly earnings average $3.07.

	United States		Northeast		North Central		South		West	
Characteristic	Avg. hourly earnings	Wages as % of contract	Avg. hourly earnings	Wages as % of contract	Avg. hourly earnings	Wages as % of contract	Avg. hourly earnings	Wages as % of contract	Avg. hourly earnings	Wages as % of contract
All schools	$3.07	25.7	$3.32	24.0	$3.27	25.4	$2.62	26.9	$3.27	26.0
Elementary	2.80	25.3	3.12	25.7	3.02	24.2	2.25	25.3	3.26	25.4
Secondary	3.28	26.1	3.48	22.9	3.45	26.2	3.06	28.5	3.28	26.3
In metropolitan area	3.21	25.8	b	b	3.48	24.7	2.80	27.8	3.39	26.3
Not in metropolitan area	2.87	25.6	3.13	25.5	2.72	27.7	2.24	24.7	3.14	25.7
Construction cost group (in thousands):										
$200 and under	2.69	26.2	b	b	b	b	2.69	27.3	b	b
$201-$300	2.54	26.1	.....	....	b	b	2.29	25.9	2.81	24.3
$301-$400	2.74	26.5	b	b	b	b	2.26	25.7	3.33	27.5
$401-$500	2.85	27.0	.....	....	b	b	2.31	24.2	3.26	26.8
$501-$1,000	2.95	23.4	3.15	25.3	b	b	b	b	3.33	23.4
$1,001-$2,000	3.31	28.2	b	b	b	b	3.19	29.6	b	b
$2,001 and over	3.37	24.3	b	b	b	b	.....	....	b	b
Type of framing:										
Steel	3.07	25.6	3.38	23.5	b	b	2.79	27.5	3.17	26.0
Concrete	2.84	24.9	.....	....	3.36	25.0	2.24	26.0	2.99	22.8
Load bearing masonry	3.01	25.0	3.15	25.3	2.96	27.8	2.48	24.9	b	b
Wood	3.37	27.3	.....	....	.....	....	.....	....	3.36	27.3

a based on federally aided projects only.
b insufficient data to warrant presentation.



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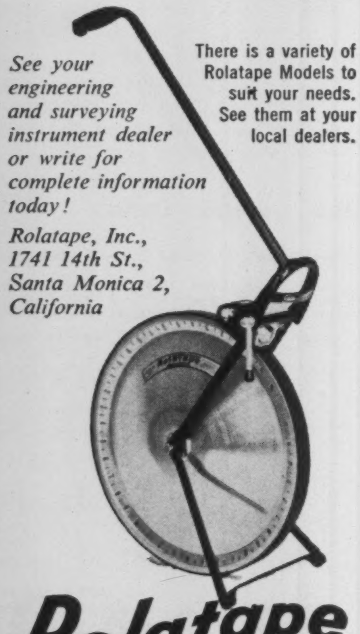

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. . . School Construction

more steel in the North Central region.

The states included in each of the regions are: **Northeast**, Conn., Me., Mass., N. H., N. J., N. Y., Pa., R. I., Vt.; **North Central**, Ill., Ind., Iowa, Kan., Mich., Minn., Mo., Neb., N. D., Ohio, S. D., Wis.; **South**, Ala., Ark., Del., D. C., Fla., Ga., Ken., La., Md., Miss., N. C., Okla., S. C., Tenn., Tex., Va., W. Va.; **West**, Ariz., Calif., Colo., Idaho, Mont., Nev., N. M., Ore., Utah, Wash., Wyo.

All of the schools represented in the study were built under contracts awarded between July 1958 and June 1959. To establish comparability, the survey was limited to new, whole school projects, excluding additions. The sample covers both federally aided construction and schools built without government assistance. Information on schools built without federal aid was gathered from public officials and private contractors involved in the construction activities, and material on federally aided projects was developed from data filed by the contractors with the Housing and Home Finance Agency.

Materials Take 55.5% of the School Construction Dollar
This is where the money goes, out of each $1,000:

Selected products and product groups	United States	Northeast	North Central	South	West
All ptoducts	$554.60	$521.90	$574.70	$577.80	$550.90
Stone, clay, and glass products	138.10	132.00	161.60	150.40	119.80
Cement, concrete, and gypsum products	76.40	72.60	84.30	84.50	68.60
Ready-mix concrete	38.80	37.80	34.80	41.00	40.20
Concrete block	13.20	16.20	17.10	15.70	6.40
Precast concrete products	7.40	a	15.50	8.80	6.40
Gypsum products	6.80	7.60	6.80	8.40	5.10
Cement	6.10	4.70	4.60	6.00	8.30
Concrete pipe	3.20	3.90	4.30	3.70	1.50
Structural clay products	23.30	22.70	32.00	29.80	13.70
Brick and structural tile	15.50	15.25	24.70	19.00	7.60
Ceramic tile	6.60	5.60	6.40	9.80	5.10
Other stone, clay, and glass products	38.40	36.70	45.30	36.10	37.50
Fibre glass products	13.00	11.80	16.90	9.60	14.10
Window glass	6.30	6.00	7.30	6.40	6.00
Asphalt tile	5.20	3.00	6.30	6.20	5.60
Sand and gravel	3.80	2.90	5.10	3.40	4.00
Cut stone	3.30	5.40	4.30	2.50	1.70
Metal products (except plumbing and heating)	161.00	154.50	155.20	177.10	156.70
Fabricated structural metal products	117.70	120.20	112.30	135.10	105.20
Structural steel	29.60	27.80	35.80	30.10	27.00
Reinforcing bars and joists	23.40	26.50	21.60	25.40	20.50
Fabricated sheet metal	20.70	17.10	17.10	21.60	25.10
Metal windows	16.10	17.10	10.70	25.30	11.40
Ornamental metal	11.40	12.90	9.00	15.70	8.20
Metal doors	8.40	14.10	9.00	7.20	4.40
Other fabricated metal products	17.60	13.70	18.40	16.20	21.30
Builders' hardware	12.00	9.40	11.60	11.10	14.90
Other metal products	25.70	20.60	24.50	25.80	30.20
Copper products	10.70	7.80	12.40	12.20	10.90
Partitions, lockers, and shelves	7.80	10.20	3.90	9.90	6.40
Galvanized sheel metal	5.60	2.10	7.00	2.50	9.90
Plumbing products	34.20	31.50	36.90	33.30	35.50
Steel and galvanized pipe	10.90	10.20	10.60	10.30	12.00
Plumbing fixtures	10.40	7.70	10.50	10.90	12.00
Cast-iron pipe	8.30	7.30	12.00	7.60	7.60
Heating and ventilating equipment	51.00	51.10	59.20	54.80	43.30
Radiators, convectors, and boilers	14.40	12.60	20.20	18.40	9.30
Temperature controls	12.80	12.70	16.80	12.30	10.90
Unit heaters and ventilators	12.10	11.70	14.70	12.60	10.60
Blowers, exhaust and ventilating fans	4.60	7.00	2.10	5.10	3.60
Warm air furnaces	3.20	3.60	2.60	4.20	2.50
Electrical equipment, fixtures, and wire	58.10	53.60	65.60	57.20	58.10
Lighting fixtures	19.20	15.90	20.90	22.30	18.30
Noncurrent carrying wiring devices	14.90	14.90	17.60	13.40	14.50
Switchboards and panelboards	6.50	6.20	9.00	5.50	6.00
Wire and cable	6.10	6.20	5.40	7.60	5.40
Program equipment	3.30	2.90	2.60	2.70	4.60
Lumber and lumber products	47.90	36.10	43.60	29.50	74.20
Millwork	23.00	22.20	21.50	19.00	27.50
Rough and dressed lumber	19.50	9.10	17.40	6.60	38.90
Flooring	3.00	3.10	4.10	2.80	2.50
Petroleum products	11.20	7.90	9.30	11.50	14.70
Asphalt and tar pitches	4.00	3.30	4.10	4.50	4.20
Asphalt paving	3.00	1.40	a	3.20	5.50
Asphalt felts	3.00	2.40	2.70	2.40	4.20
Fixed school equipment	16.10	19.90	13.20	18.30	13.00
Chalkboards and tackboards	4.10	3.90	3.70	4.70	4.00
Kitchen equipment	5.30	8.40	3.40	5.80	3.60
Paints and other chemical compounds	7.80	7.40	7.90	9.10	7.20
Paints	4.20	4.30	3.40	4.40	4.70
All other	29.10	27.80	22.20	36.50	28.40
Construction equipment	13.90	a	a	a	a
Insulating board	4.20	2.70	4.30	8.00	2.50

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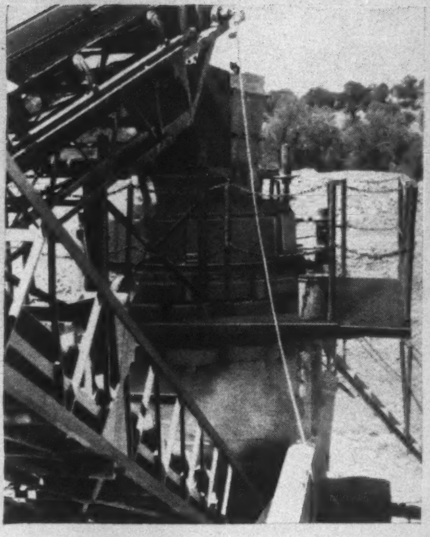

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When A. Teichert & Son, of Sacramento, decides to custom-build a portable plant, they refuse to sacrifice capacity for mobility. That's why they selected two Symons Cone Crushers as the heart of this unitized plant. They can produce up to 700 tons of 1½″ base material per hour. Even crushing 50%, they usually exceed 500 tons per hour. And with all units trailer-mounted, they can move quickly from one job to another and start producing immediately. Set-up consists of adjusting the jacks, erecting the conveyors and connecting the power.

This Teichert plant is supplying aggregate for road-building projects in northern California, a job requiring frequent moves. The highly mobile plant includes two Symons Cone Crushers . . . a 4¼ ft. Standard Cone as secondary, and a Symons 4 ft. Short Head Cone for closed circuit tertiary reduction to ¾″ x ⅜″ hot mix aggregate and ⅜″ x 0″ sand.

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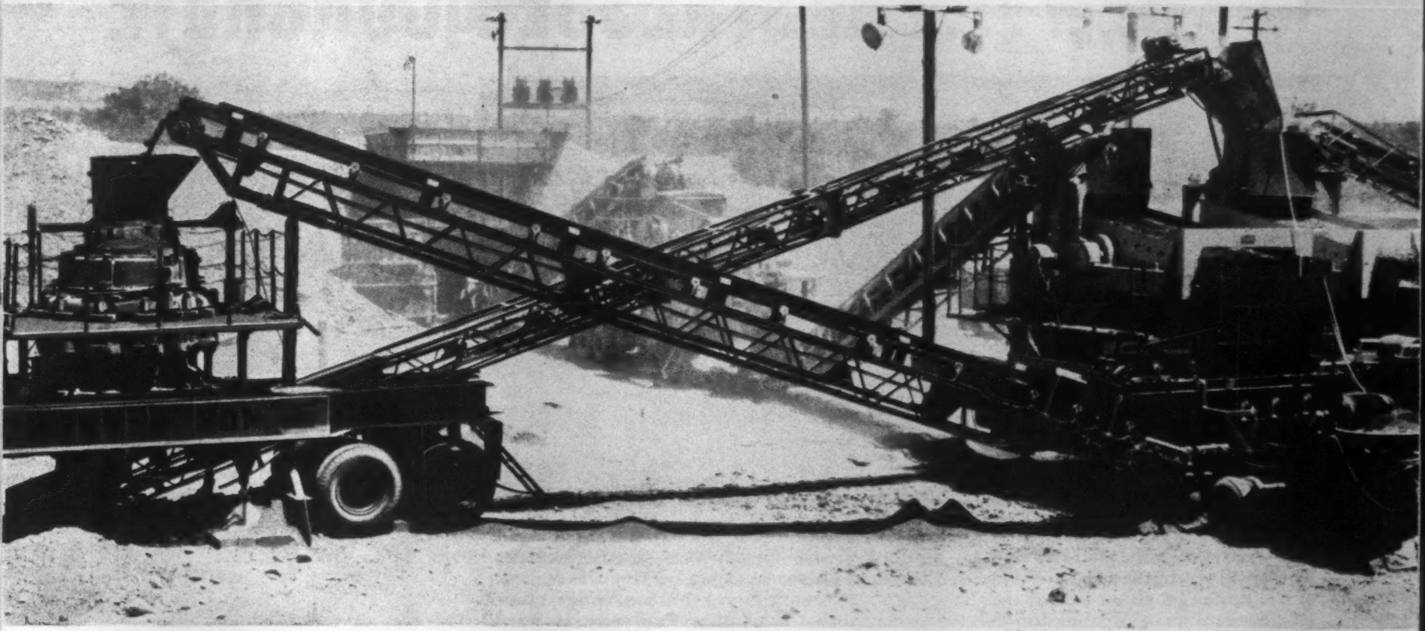

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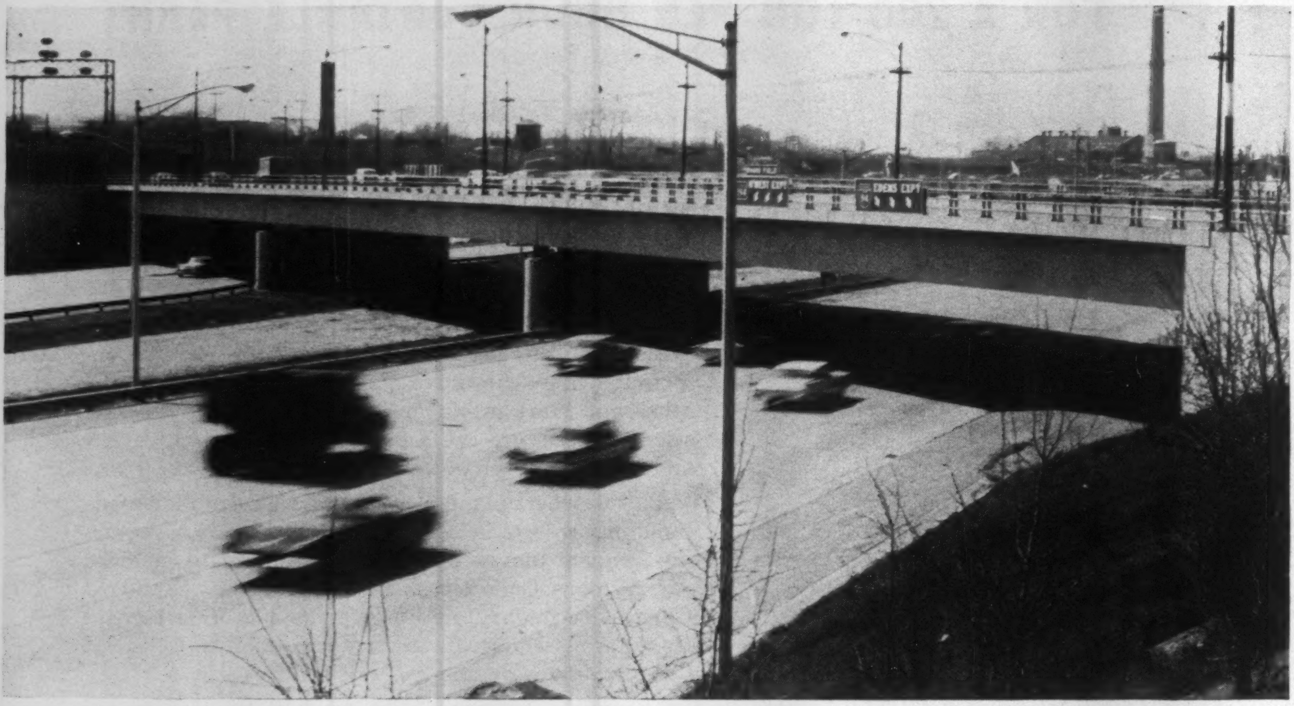

FIRST POST-TENSIONED major highway bridge in Illinois forms a grade separation over the Edens and Northwest Expressway interchange in Chicago. The 30 concrete girders were cast in place and the earth later removed from beneath the spans. Center span is 152 ft. long . . . two abutment spans, 156 ft. Engineers: Cook County (Ill.) Dept. of Highways. Consulting Engineers: Schupack & Zollman. General Contractor: Thomas McQueen Company.

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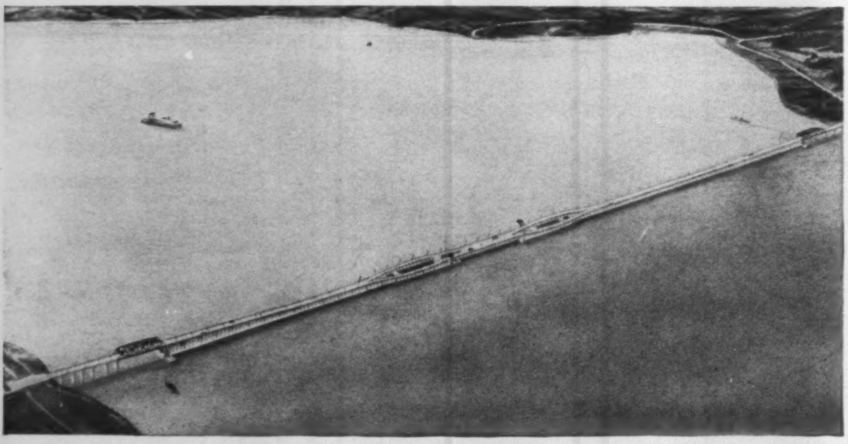
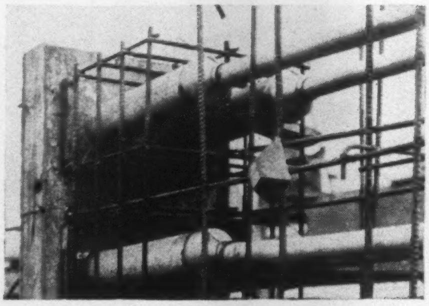
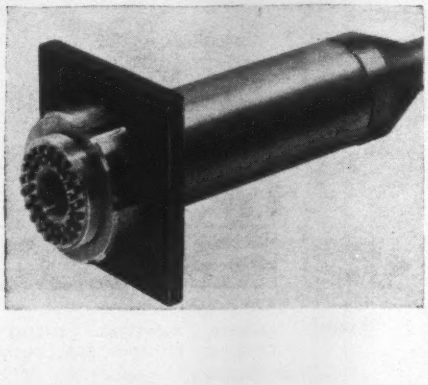


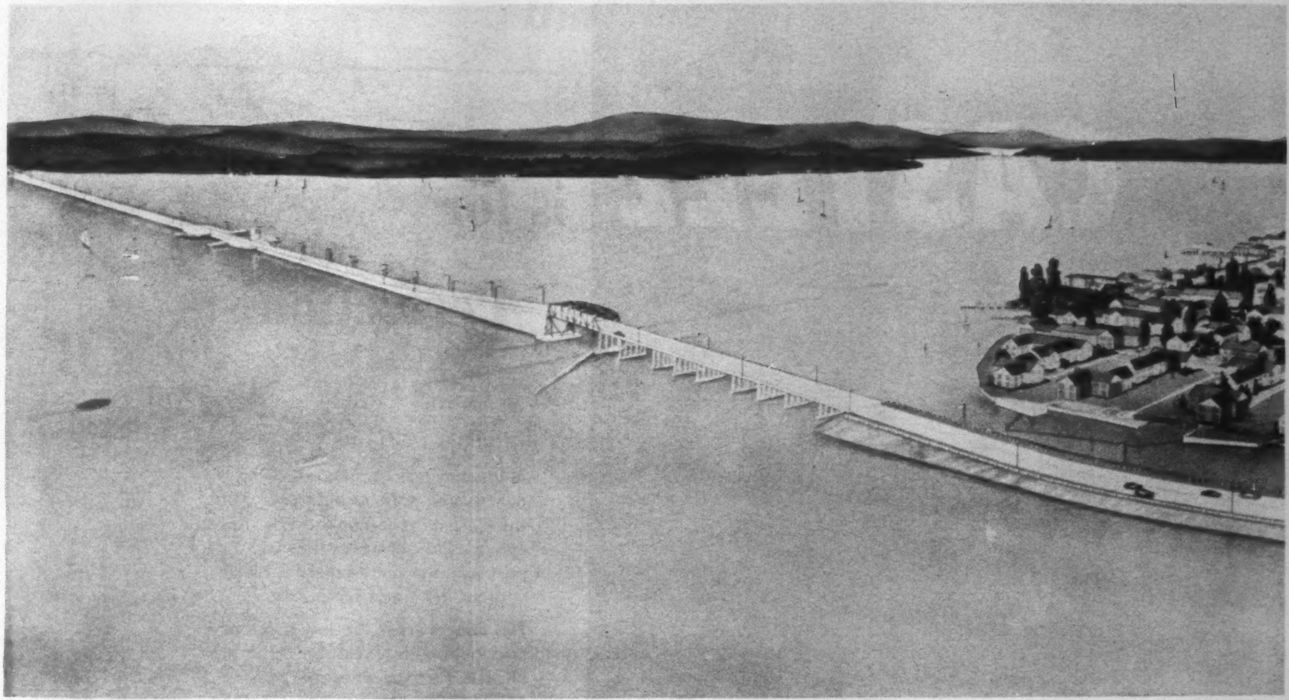
REPAIR AND STRENGTHENING of 1½-mile pontoon bridge across the Hood Canal near Seattle. Each pontoon will be reinforced with twenty-four 40-wire tendons. These will strengthen the pontoons and the joints between them, making the sections of the bridge on either side of the draw span into a continuous prestressed structure. Engineers: State of Washington Toll Bridge Authority. Consulting Engineers: Howard, Needles, Tammen & Bergendoff. General Contractor: Yuba Erectors Division of Yuba Consolidated Industries.



DETAIL OF END ANCHORS of Ryerson tendon assemblies and reinforcing steel at end of typical girder before closing forms.



MOVABLE ANCHOR HEAD of Ryerson BBRV system assembly after stressing. The movable anchor head is positively held in its final position by means of a lock nut screwed against the bearing plate. The center hole, after removal of the pull rod is used as the grout inlet.



SECOND LAKE WASHINGTON FLOATING BRIDGE will link Seattle and Evergreen Point, Wash. It will be made up of 29 units, each post-tensioned by approximately 40 tendons of 14 or 26 wires. Two movable pontoon sections will retract each way from the center to provide a 200-ft. clear opening. Engineers: State of Washington Toll Bridge Authority. General Contractor: Guy F. Atkinson Company.

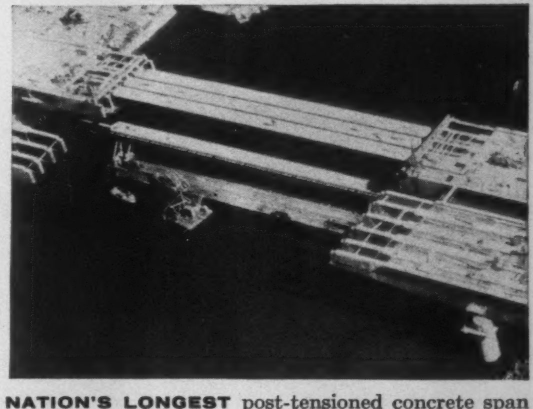
BRIDGES post-tensioned by Ryerson

In concrete structures the spotlight is on prestressing—and there's no more versatile and practical method of prestressing than Ryerson post-tensioning by the BBRV system.

Shown here are only four recent jobs in which Ryerson post-tensioning was used. In addition, everything from lift-slab libraries to parking garages, expressway embankments to airfields, are being built with the help of Ryerson post-tensioning service.

This unique Ryerson service covers prestressed concrete application completely—from adaptation of the engineers' design through the final stages of field erection, including force development calculations, quality-controlled tendon and anchorage assembly, equipment for precise stressing and positive grouting, job-site technical assistance and dependable deliveries. And the entire service is wrapped up in a complete, single-priced post-tensioning package.

For further information on post-tensioning and other Ryerson products and services for the construction industry, contact your nearby Ryerson plant.



NATION'S LONGEST post-tensioned concrete span is the 320-ft. center span of the Oneida Lake Bridge near Brewerton, N.Y. The post-tensioning "package" included over 1000 tendon and anchorage assemblies—used in twenty-four 146-ft. cantilever girders, each weighing 240 tons...and ten 231-ft. drop-in girders weighing 230 tons apiece. Owner: State of New York, Dept. of Public Works. Engineers: Summers, Munninger & Molke. General Contractor: Terry Contracting, Inc.

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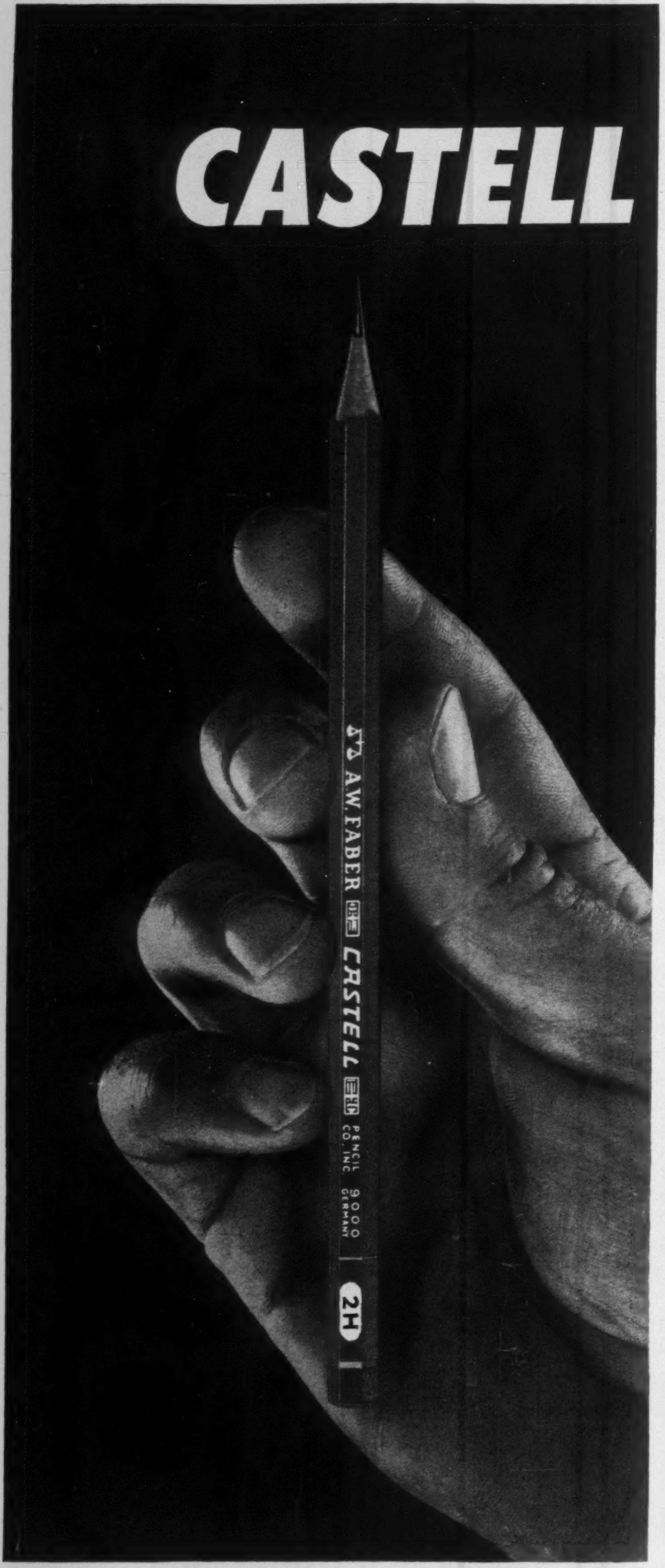
CIRCLE 113 ON READER SERVICE CARD

CASTELL is for Perfectionists



A layman picks up two drawing pencils and sees no difference. But the *Perfectionist* knows. His trained eye instantly observes the rich, crisp opaque line that *stays* black without flaking or feathering.

His fingers sense the low index of friction which gives him smooth, effortless strokes. He sharpens CASTELL, testing for non-crumbling, strong-textured lead and non-splintering wood. Next he tries chisel point, then needle point. He checks the perfect balance between coverage and easy erasability on paper and vellum, on Cronar and Mylar base films. When the print comes out of the machine, he examines it with a magnifying glass.

Then he knows the satisfaction that only a Perfectionist feels when he finds the perfect working tool. 20 superb degrees, 8B to 10H. Join the masters of *your* profession. Buy CASTELL, call your dealer today.

#9800 SG Locktite Tel-A-Grade *Lead Holder with no-slip, functional grip that's kind to tired fingers ■ Bull dog clutch ■ Unique degree indicator ■ Carries 2-year guarantee* ■ **Castell Drawing Leads #9030,** *identical in grade and quality with world-famous Castell drawing pencil ■ Usable in all standard holders, but perfect for Locktite ■ Draws perfectly on all surfaces, including Cronar and Mylar base films ■ 7B to 10H, and a kaleidoscope of colors ■*

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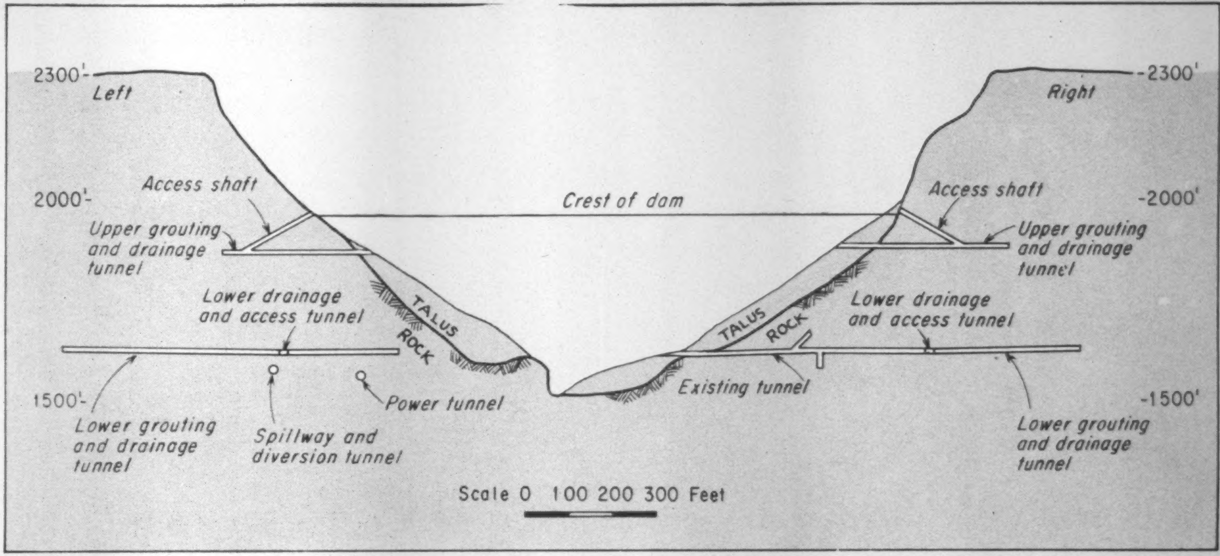

2300'
Left
Right
-2300'
2000'
Access shaft
Crest of dam
Access shaft
-2000'
Upper grouting and drainage tunnel
Upper grouting and drainage tunnel
Lower drainage and access tunnel
TALUS ROCK
TALUS ROCK
Lower drainage and access tunnel
1500'
Power tunnel
Existing tunnel
-1500'
Lower grouting and drainage tunnel
Spillway and diversion tunnel
Lower grouting and drainage tunnel
Scale 0 100 200 300 Feet

PROFILE ALONG AXIS OF DAM shows tunnels for diversion, spillway, grouting, drainage and access for Round Butte Hydroelectric Development on the Deschutes River, Ore.

Tunnel Bids Start Oregon Hydro Project

This $3.2 million contract for tunnels—diversion, spillway, grouting, drainage and access—launches Portland General Electric Co.'s Round Butte Hydroelectric Development on the Deschutes River, Ore. Bechtel Corp., San Francisco, is the engineer.

The award to Peter Kiewit Sons' Co., Omaha, Neb., for $3,216,454 is 2.5% under second low, Kuckenberg Construction Co., Portland, and 26% short of the high of ten bidders.

Peter Kiewit Sons' scored with a low of $1.50 a yard for 23,000 cu yd of unclassified excavation, spillway intake. Their bid was $1.50 a yard under the second low unit bid and $12.50 under the high. Excavation prices account for 58% of the contract and range from $22.00 to $35.36 a cu yd for 38,400 cu yd diversion tunnel, from $24.00 to $44.00 for 11,200 cu yd spillway tunnel, and from $67.00 to a high of $123 a lin ft for 2,300 ft, lower grouting and drainage tunnels.

Concrete prices also show a wide spread. They range from a low of $40.00 to a high of $60.00 a cu yd for 11,800 cu yd for diversion tunnel lining, and from $47.00 to $119 for 1,022 cu yd for spillway tunnel lining.

The Round Butte dam site is in Jefferson county, about 8 miles southwest of Madras, Ore., on the Deschutes River about a half mile below the junction with the Metolius River.

The diversion tunnel will pass the river flows during dam construction. After completion, the downstream portion of the tunnel will be used as a continuation of the spillway tunnel. The tunnel will be approximately 2,050 ft long, 21 ft inside dia, and concrete-lined throughout.

It will also have an intake structure designed for closure by a bulkhead. The outlet will have a gunite-lined channel section. Gunite bids range from a low of $1.50 to a high of $9.50 a sq ft for 4,200 sq ft.

The 270-ft long spillway tunnel is 21 ft in dia, concrete-lined, and sloped at 52 deg from the horizontal. Only the transition section and intake will be excavated under this contract. No concrete lining is required in the transition, and no structure at the intake.

The abutment tunnels will be excavated into both abutments for later grouting, drainage and access purposes. Grouting and drainage tunnel lengths total approximately 3,000 lin ft of 6x9-ft clear opening, the access tunnel 1,320 lin ft of 6x7-ft clear openings.

The Portland General Electric Co. will supply, free of cost to the contractor, all fabricated reinforcing steel for the tunnels. Placing reinforcing steel ranges from $0.25 to $0.10 a unit for 461,000 lb.

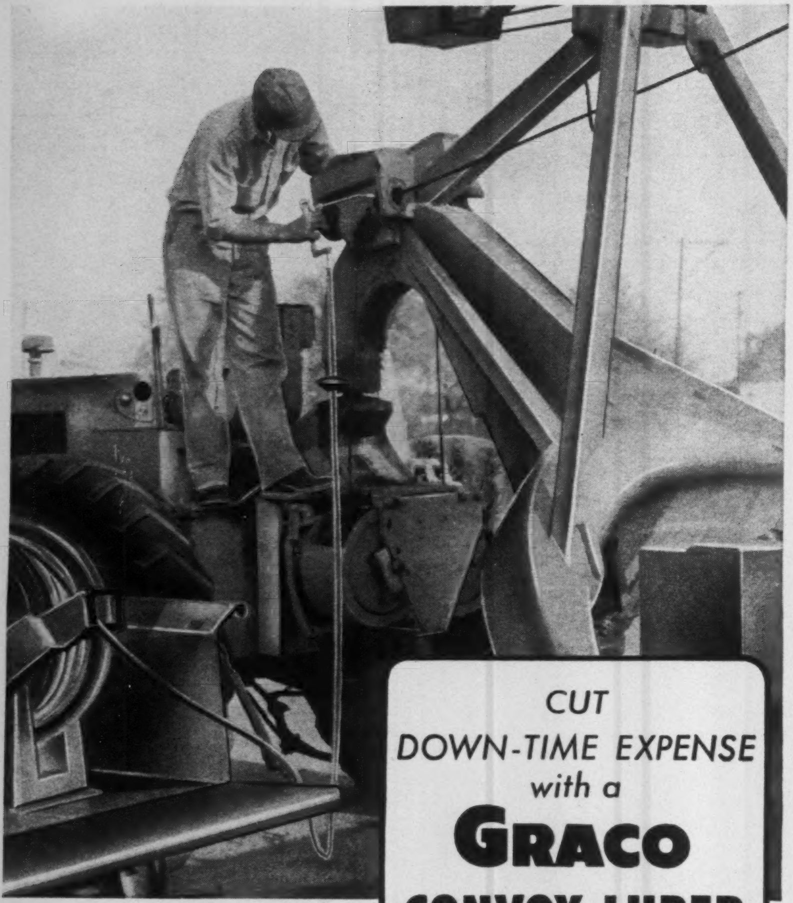
Wage rates include: carpenters, $3.63/hr; cement masons, $3.64; iron workers, reinforcing $3.72/hr and structural $3.92/hr; general laborers, $2.90/hr; plumber-steamfitter, $4.08; air compressor operator (portable or stationary under 1,000-cf capacity), $3.57/hr.

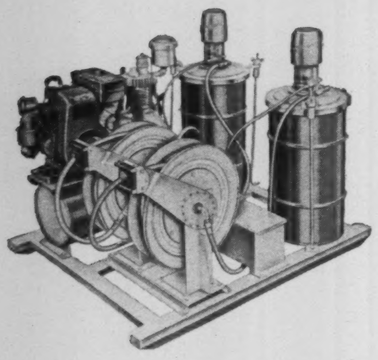
The bidding included:

1C	Peter Kiewit Sons' Co., Omaha, Neb	$3,216,454
2	Kuckenberg Const. Co., Inc., Portland, Ore., and A. J. Cheff Const. Co., Seattle, Wash	3,300,270
10	Walsh Const Co.,	
EE	Bechtel Corp., San Francisco, Calif	3,096,540

Bids: 7-20-61			Unit Prices	
Items	Unit	Quantity	1 C	2
Exc, uncl, diversion tunnel, untake & outlet	cy	27,000	$6.60	$5.00
spillway intake	cy	23,000	1.50	5.00
Rock bolts, f & i	lf	1,000	2.89	5.00
Anchors, reinf bar, 1 only	lf	1,000	1.31	4.00
Exc, diversion tunnel	cy	38,400	24.15	22.00
spillway tunnel	cy	11,200	30.68	24.00
temporary tunnels	lf	200	116.00	200.00
grouting & drainage tunnels, lower	lf	2,300	77.00	116.00
upper	lf	550	90.00	118.00
access tunnels, lower	lf	1,100	70.00	107.00
upper	lf	700	77.00	115.00
Water, handling	ls	job	16,210	85,000
excess	lcfs day	300	10.00	4.00
Tunnel supports, diversion & spillway, f, i & maintain	lb	676,000	0.18	0.33
Laggings, sills, bracing, spiling & blocking lf of supported tunnel, f, i & maintain	lf	2,480	16.00	66.00
Grout holes, drilling	lf	7,220	3.50	4.50
Grouting, connections	ea	350	15.18	10.00
pressure, cf of cement	cf	8,000	5.74	8.00
Conc, diversion tunnel lining	cy	11,800	56.78	40.00
intake	cy	570	76.60	68.00
spillway tunnel lining	cy	1,022	86.00	50.00
Cement, f & handle	bbl	20,350	10.30	6.00
Gunite	sf	4,200	1.61	6.00
Steel, reinf, place	lb	461,000	0.08	0.06
Bhd guides & support beams below elevation 1608, i only	lb	110,000	0.19	0.15
Bhd & support steel above elevation 1608, i only	lb	170,000	0.07	0.15
Metalwork, misc, f & i	lb	1,000	1.20	1.00
Platform in spillway tunnel, steel supported, f & i	ls	job	2,000	5,000

ENR Constr. Cost Index (1913=100) 20-cities avg.—853.64





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See Phone Book Yellow Pages "Lubricating Equipment" for Graco Suppliers

Precast Trestle Work Bucks California Traffic

A four-lane, 4½-mile concrete trestle for the California Department of Public Works, Division of San Francisco Bay Toll Crossings, will cost $13,278,590. Peter Kiewit Sons' Co., San Francisco, was low, 6.2% under the second low joint venture (Morrison-Knudsen Co. Inc., San Francisco, Perini Corp., Framingham, Mass., and LeBoeuf-Dougherty Contracting Co., Inc., Seattle), 20% below estimate, and 31% under the high of seven bidders. N. C. Raab is the Project Engineer for the Division of San Francisco Bay Toll Crossings.

Bids for the largest single cost item, furnishing precast class L concrete deck units (acounting for 24% of cost) range from $840 to $1,300 each for 3,212 units. And prices for installing deck units soared from a low of $120 each to a high of $608.

The 4.5-mile trestle, is part of the San Mateo-Hayward Bridge Improvements project. The contractor must keep vehicular traffic moving on the San Mateo-Hayward bridge and approaches during construction. Part of the new trestle replaces an existing trestle which must be removed.

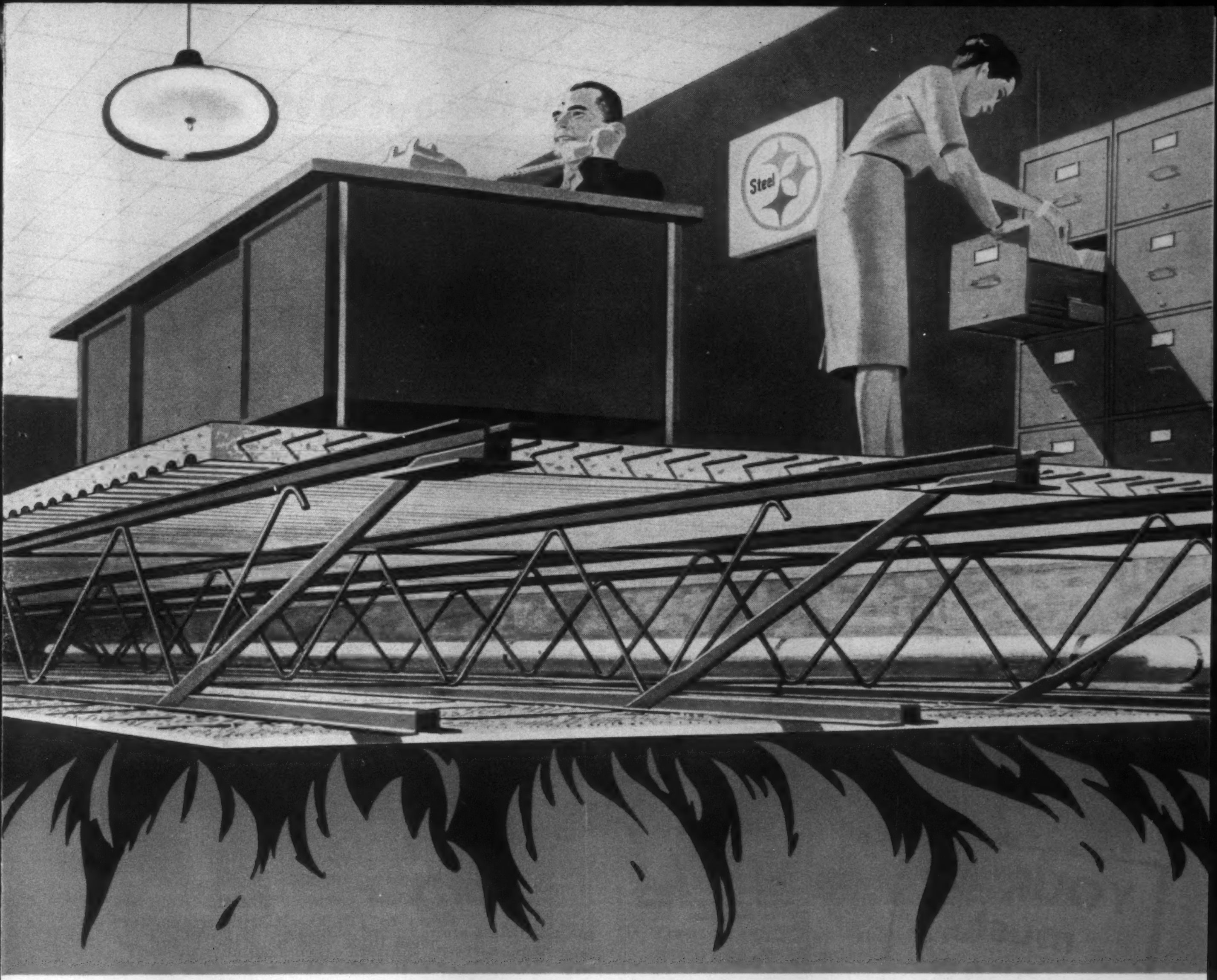
Basic hourly wage rates include: asphalt plant engineer, $3.92/hr; carpenter, $3.725; cement dumper, $3.325; concrete laborer (wet or dry), $3.325; and concrete mixer operator (over 1 yd), $3.87/hr.

The bidding included:

1C	Peter Kiewit Sons' Co., San Francisco, Calif	$13,278,590
2	Morrison-Knudsen Co., Inc., San Francisco, Calif., Le Boeuf-Dougherty Contr. Co., Inc., Seattle, Wash	14,155,845
7	Connolly-Grafe[1], San Francisco, Calif., Brayer Electric Co., San Francisco, Calif., Chas. L. Harney, Inc., San Francisco, Calif.	19,275,711
EE	Calif. Dept. of Publ. Works, Div. of San Francisco Bay Toll Crossings	16,600,000

Bids: 7-11-61 Items	Unit	Quantity	Unit Prices 1 C	 2
Traffic stripe, remove exist.	lf	1,000	$0.25	$0.20
new	lf	116,000	0.05	0.06
Guard railing, metal plate, remove & relocate exist.	lf	90	5.00	9.00
Conc, remove	cy	51,000	18.00	16.00
Piles, remove exist	ea	100	500.00	400.00
Exc, str	cy	200	4.00	3.00
Backfill, str	cy	55	6.00	15.00
Borrow, imported	cy	25,000	2.00	2.50
Aggr base, cl 2	t	5,700	3.00	3.75
min, tp A asph conc	t	935	8.00	9.00
Liquid asph, SC-2, prime ct & penetration treatment	t	17	60.00	40.00
Paving asph, asph conc	t	60	8.00	9.00
Asphaltic emul, paint binder.	t	2	90.00	60.00
Piles, prestressed conc, 24"φ,				
f only	lf	420,000	4.75	6.60
drive	ea	4,840	330.00	270.00
Pile caps, precast conc, cl A,				
f only	ea	1,620	600.00	408.00
install	ea	1,620	203.00	270.00
Deck units, precast conc, cl L,				
f only	ea	3,212	1,000	840.00
install	ea	3,212	220.00	240.00
Curb & railing units, precast conc, cl L, f only	lf	47,700	12.00	14.0
install	lf	47,700	2.00	5.00
Conc, cl A, cast-in-place	cy	2,320	60.00	70.00
Steel, bar reinf	lb	8,000,000	0.085	0.10
str	lb	5,000,000	0.15	0.20
Deck armor	lb	720,000	0.20	0.34
Metals, misc	lb	460,000	0.40	0.55
				0

ENR Constr. Cost Index (1913=100) 20-cities avg.—853.64
ENR Building Cost Index (1913=100) 20-cities avg.—571.66



This floor-ceiling construction resists fire for 3 hours or more

Whenever fire-resistance is a primary requirement . . . the Bethlehem Open-Web Steel Joist construction shown above is hard to beat. It provides fire protection of 3 hours or more, as required for Class A fireproof structures such as stores, schools, hospitals, and apartments.

The top slab is 2½-in. reinforced concrete. Ceiling is a 1-in. layer of gypsum-vermiculite plaster applied on metal lath and proportioned in the range 2:1 to 3:1 gypsum to heat-expanded vermiculite by weight. Bethlehem Slabform provides an excellent solid steel centering for the slab.

The nearest Bethlehem sales office will be glad to give you full details on both steel joists and Slabform or any other of the many steel products made by Bethlehem for building construction. And, if you wish, one of our engineers will visit you and discuss your building. No obligation, of course.

Steel *for Strength*
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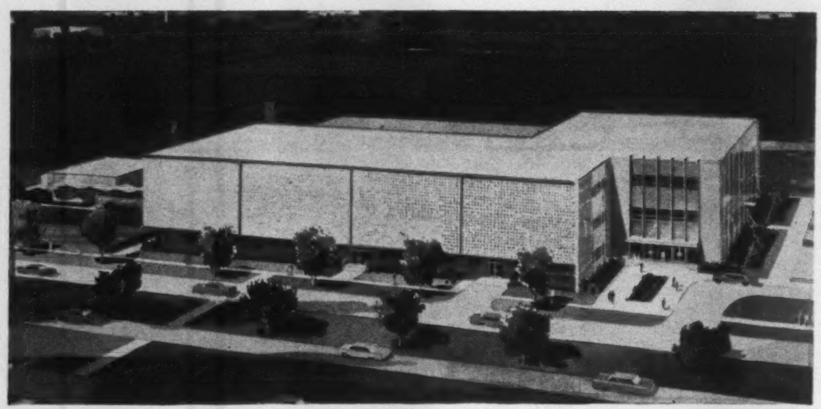


AEROMEDICAL RESEARCH BUILDING for Will Rogers Field at Oklahoma City includes high altitude test chambers, special electrical and temperature control systems and underground isotope storage vault.

Civil Aeromedical Center Cost Analyzed

Harmon Construction Co., Oklahoma City, Okla., priced the country's first civil Aeromedical Research Institute building at Will Rogers Field, Oklahoma City at $5.5 million, $25.83 a sq ft. Hudgins, Thompson, Ball & Associates, Inc., Oklahoma City, are the engineers. The building will be leased to the Institute by the Federal Aviation Agency.

Items	—$ and % of total—	
Excavation, basement	47,739	0.86
footings	14,770	0.27
Grading & subgrade	23,766	0.43
Concrete footings	35,245	0.64
Basement walls & grade beams	91,264	1.65
Columns, beams slabs	490,075	8.86
Masonry	182,816	3.31
Carpentry	9,917	0.18
Millwork	54,016	0.98
Glass & glazing	15,720	0.28
Hardware	51,853	0.94
Lath & plaster	256,363	4.63
Structural steel	109,858	1.99
Miscellaneous iron	59,153	1.07
Painting	55,125	0.99
Roofing & sheet metal	51,203	0.93
Metal doors & frames	42,457	0.77
Windows & curtain walls	89,250	1.61
Marble & tile	167,092	3.02
Resilient floors	55,319	1.00
Plumbing	466,296	8.43
Mechanical	946,724	17.10
Electrical	694,377	12.55
Sterilizers	73,500	1.33
Metal casework	338,520	6.12
Acoustical ceilings	71,505	1.29
Concrete curbs & paving	54,385	0.98
Asphalt paving	105,394	1.91
Elevators	82,656	1.50
X-ray equipment	4,073	0.07
Pneumatic tube	22,972	0.42
Kitchen equipment	9,065	0.16
Space Corporation	714,588	12.92
Cold storage	12,555	0.23
Concrete floor topping	32,177	0.58
Total	$5,531,788	100%

Starting date: 5/1/61
Completion date: 9/1/62

ENR Building Cost Index (1913=100) 20-cities avg.—569

The 214,170-sq ft building will house offices and research laboratories for the only installation in the U.S. for aeromedical research for civil aviation. It will be a fireproof structure with three floors, a basement, a 100 x 160 x 26-ft mock-up area, an underground isotope storage vault, and separate animal quarters connected by a covered passage.

Special facilities include one human- and two animal-environmental test chambers, two high-altitude test chambers, a temperature-controlled pool, deceleration track and provisions for future installation of shaker tables.

The human-environmental chambers will be 10 x 20 x 10 ft and the animal chambers 8 x 10 x 8 ft. Both have temperature ranges from −60 to +60 F, and humidity ranges from 10 to 100% (in a temperature range from 40 to 160 deg). One altitude chamber holds 20 men and produces altitudes from sea level to 150,000 ft with temperature ranges from −60 to +160 F and humidity ranges from 20 to 95%. It also has provisions for rapid decompression. The smaller 6-man chamber produces sea level to 100,000 ft altitude.

Two complete electrical systems service the building—one for normal building use, and one regulated voltage system to accommodate delicate scientific instruments. The electrical systems take 12.55% of the buildings cost.

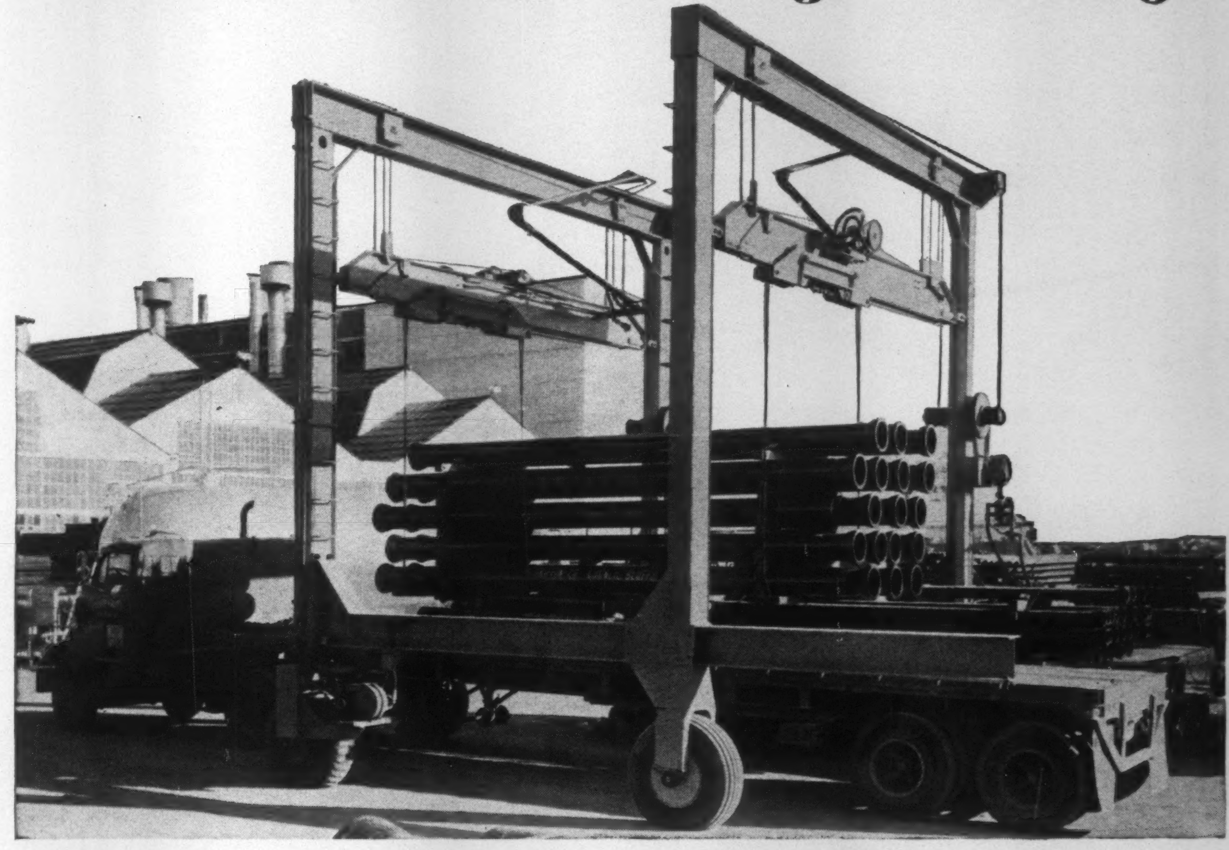
High velocity air conditioning permits individual room control. It is distributed through combination lighting and air diffusing fixtures.

Most partitions are hollow metal stud and plaster (to allow for piping). Ceilings are lay-in mineral fiber acoustical panels on grid and account for 1.29% of total. Floors are vinyl asbestos on concrete. Resilient floors at $55,319 take 1.00% of cost, and concrete floor topping at $32,177 accounts for 0.58%.

Elevators cover 1.50% of total cost. This includes three freight and two passenger elevators.

Wage rates include: common labor, $2.42/hr; carpenters, $3.375; ironworkers, structural and reinforcing, $3.65/hr.

Travelift...the versatile new way to materials handling economy



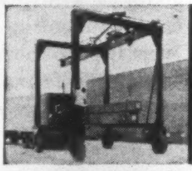
From Maine to California, from Florida to Minnesota, Travelift is on the move in Marinas, Prestressing Plants, Piggy Backing and Container Handling. Every day Travelift is saving someone time and money in a new way. It can do it for you, too.

Travelift gives you the ultimate in versatility.

- It can be self-propelled, truck pulled or operate in a fixed position.
- It handles loads from 3 to 50 tons.
- It comes equipped with single or multiple lifting points.
- Travelifts can traverse and even pinpoint a load to spot it on a dime, gently.
- Once more, every operation is hydraulically controlled by *one* man from a full view platform with every control under his thumb for complete command.

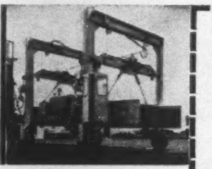
Take a look at your present materials handling equipment. Are you getting this all around versatility or are you about to write for full details on this *new* way to materials handling economy?

Over 17 models to choose from — at a lower cost than you think. Most models cost less than $1,000 per ton of lifting capacity . . . at no sacrifice in quality.



Caution! Too fragile for fork trucks, handle with Travelift. Here tons of wire cloth are loaded into a closed trailer.

Travelift carries this large tank smoothly and safely even over rough terrain.



Travelift combines brute strength with flexible handling to move this fabricated member.

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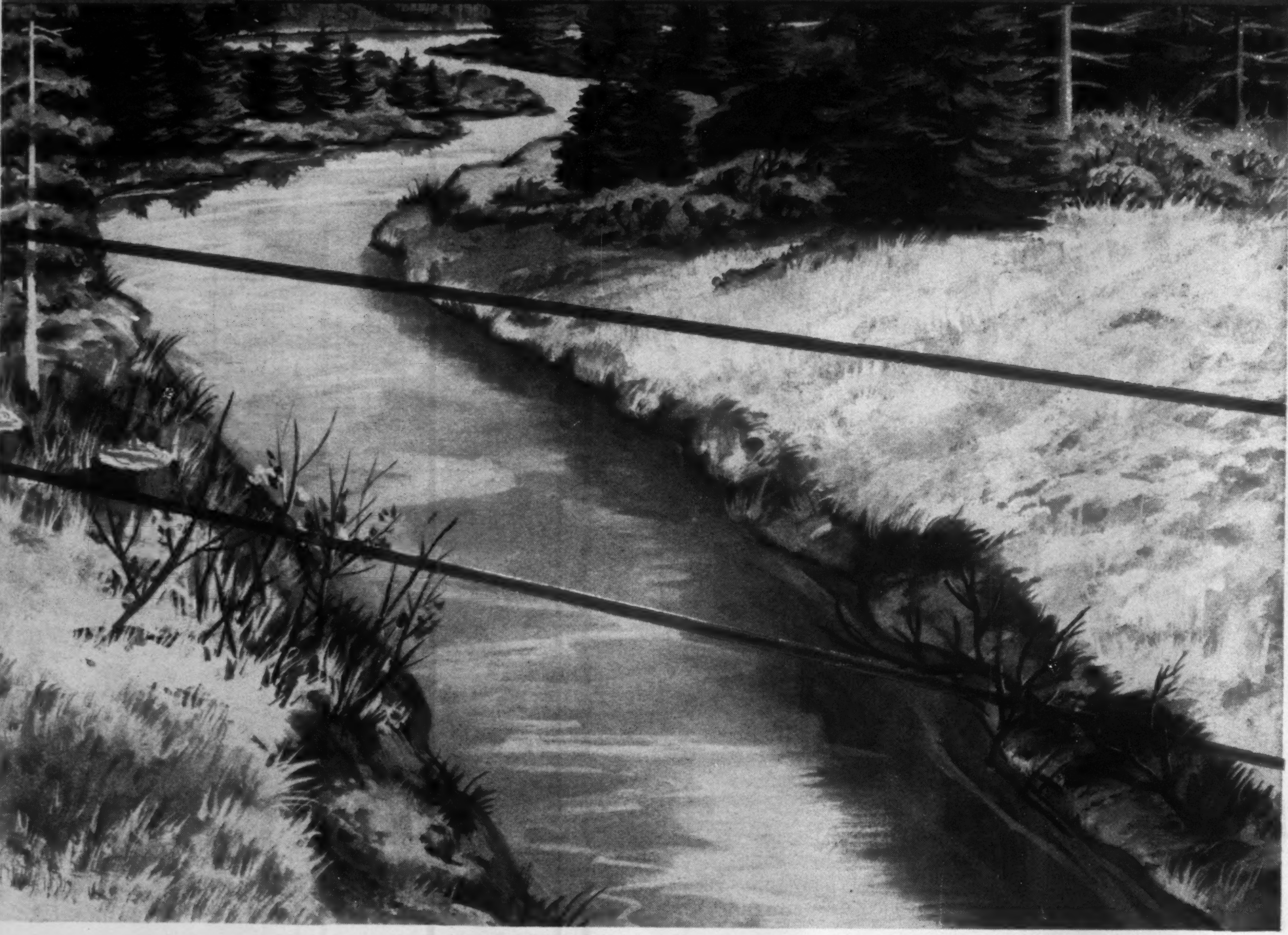
CIRCLE 119 ON READER SERVICE CARD

CORRUGATED METAL CULVERT PIPE BY WHEELING



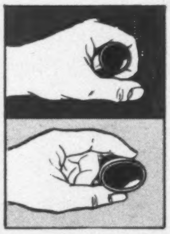
Problem: *Right-of-way must pass stream at 45° angle, instead of normal 90°. Situation further complicated because stream flows downhill at 8 mph.*

Outlasts the highway!

Tax dollars go further when you specify Wheeling Corrugated Metal Culvert Pipe for highway drainage. That's because Wheeling Culvert Pipe costs *less* to buy . . . *less* to install . . . and *less* to maintain! Here's why:

Can't disjoint—Wheeling Culvert Pipe comes in long lengths, so joints are few. What's more, they can't open because pipe has beam strength . . . and Wheeling Culvert Connecting Bands grip *both* pipe ends securely.

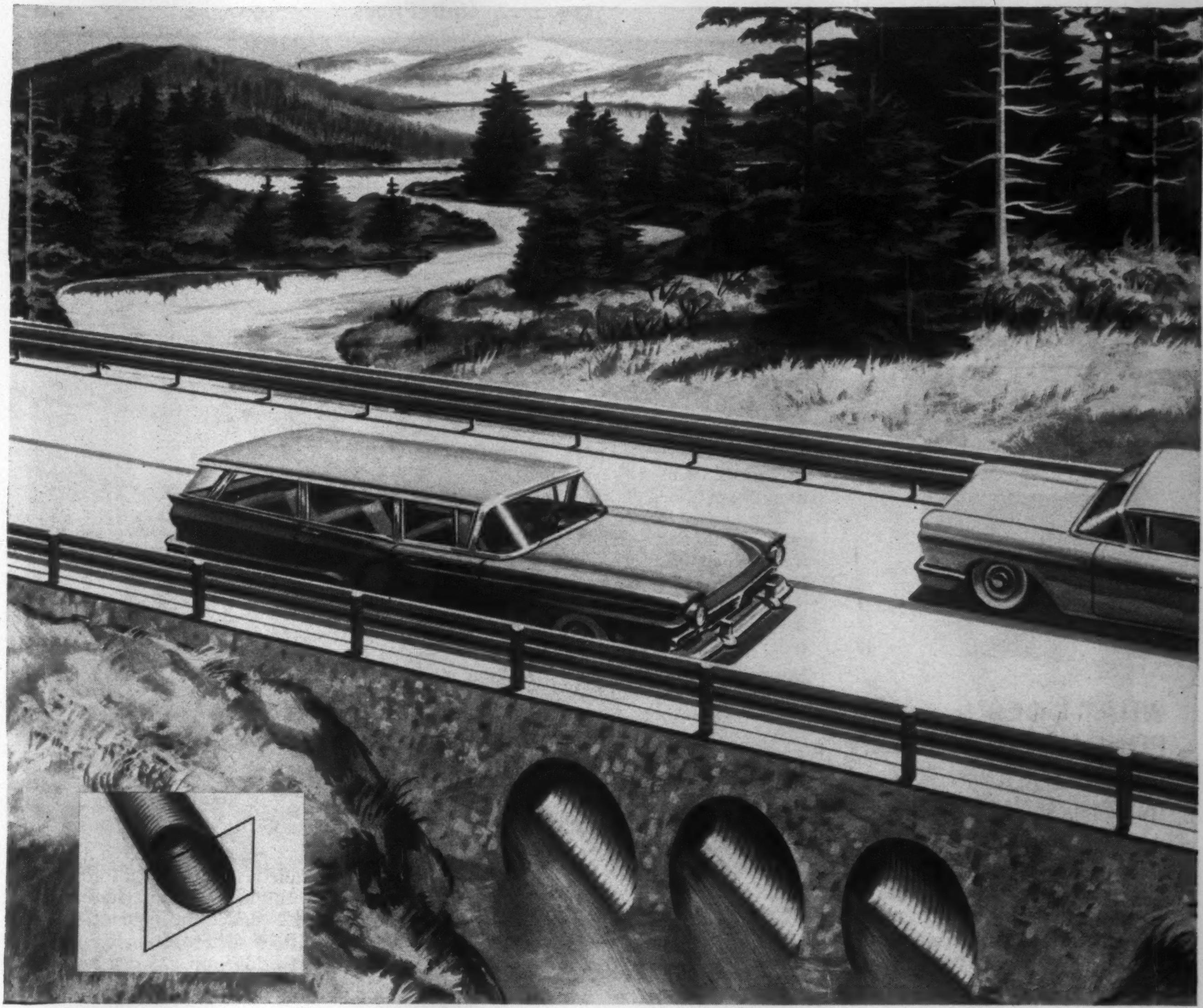
Flexible strength — Unlike rigid pipe, corrugated metal culvert pipe is flexible. So it easily absorbs shock and extreme vibration caused by shifting fill and heavy trucks. Equally important, this flexibility enables Wheeling Culvert Pipe to "borrow" strength from surrounding fill (see for yourself — try this simple test with your garden hose).



Choice of end treatments—Special end treatments (including skews and bevels) can be quickly, economically supplied by your Wheeling Culvert Plant.

WHEELING CORRUGATING COMPANY

Warehouses: *Boston, Buffalo, Chicago, Columbus, Detroit, Kansas City, Louisville, Minneapolis,*

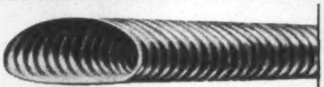


Solution: *Wheeling Metal Culvert Pipe with skewed and beveled ends. This allows the pipe structure to be designed with the stream flow ... permits the ends of the pipe to conform to the contour of the slope, thus improving efficiency and appearance.*

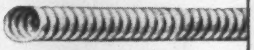
Get the full story on Wheeling Corrugated Metal Culvert Pipe and Fittings (both copper steel and copper-bearing pure iron) from your Wheeling man. Wheeling Corrugating Company, Wheeling, W. Va.

You always get fast delivery on Wheeling Culvert Pipe and Fittings because Wheeling maintains special culvert plants at Des Moines, Detroit, Kansas City, Louisville, Madison, Wis., Martins Ferry, Ohio, Minneapolis, Peoria, Philadelphia, St. Louis.

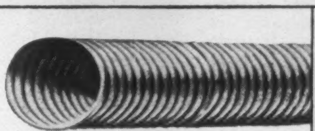
USE WHEELING CULVERT PIPE HERE, TOO!



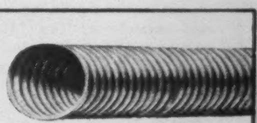
Where headroom is limited, use special wide-based Wheeling Pipe Arch.



For efficient roadside drainage, use Wheeling Small Diameter Culvert Pipe.



For deep, fast-flowing streams, use Wheeling Large Diameter Culvert Pipe.



For deep, shifting fill, use Wheeling Large or Small Diameter Culvert Pipe.

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Underlying sand boosts costs of . . .

Iowa Sanitary Sewer System

A sanitary sewer system and sewage treatment plant will cost the town of Center Point, Iowa, $310,162. The job is complicated by the geology. Fine, saturated sand underlays the town and in the past has added 10% to the cost of a similar job. Clapsaddle Engineering Co., Conrad, Iowa, is the engineer.

Two bidders priced the sewage treatment plant. Manchester Construction Co., Manchester, Iowa, was low at $96,000 on the Spiragester alternate, 19.7% under E. B. Spencer Engineering Co., Cedar Falls, Iowa. Clarigester, alternate was priced at $97,800.

The sanitary sewer system drew only one bid. Property assessment financing forced three prospective bidders to withhold bids that could not come within the required 10% of estimate. Stanfield-Pyland Construction Co., Des Moines, took the award at $214,162, 9.7% below estimate.

Prevailing wage rates include: carpenter, $3.60; plumber, $4.225.

The bidding included:

Sewage Treatment Plant

1C	Manchester Const. Co., Manchester, Iowa	$96,000
2	E. B. Spencer Engineering Co., Cedar Falls, Iowa	119,517
EE	Clapsaddle Engineering Co., Conrad, Iowa	86,000

Bids: 7-14-61 Items	Unit	Quantity	Unit Prices 1 C	 2
Plant,				
proposal Aw/spiragester*	ls	job	$96,000	$119,517
proposal B-w/clarigester.	ls	job	97,800	119,717
Alternate sewage pump				
Chicago Pump Co.	ls	3	......	+97.00
Alternate distributor				
Walker Process Equip. Co.	ls	1	......	+312.00
Lakeside Engineering Co	ls	1	......	+900.00

Sanitary Sewer System

1C	Stanfield-Pyland Const. Co., Des Moines, Iowa	$214,162
EE	Clapsaddle Engineering Co., Conrad, Iowa	195,284

Bids: 7-14-61 Items	Unit	Quantity	Unit Prices 1 C
Base Bid*			
VCP, SS, 8",			
depth, 0-6	lf	195	$3.00
6-8	lf	3,860	2.80
8-10	lf	10,327	3.10
10-12	lf	9,308	3.40
12-14	lf	2,421	3.40
14-16	lf	178	3.70
16-18	lf	100	5.90
18-20	lf	21	9.20
10",			
depth, 6-8	lf	237	4.90
8-10	lf	2,168	4.40
10-12	lf	584	4.50
12-14	lf	442	4.80
14-16	lf	171	7.20
12",			
depth, 0-6	lf	148	3.70
6-8	lf	348	3.50
8-10	lf	892	4.60
10-12	lf	1,280	4.50
12-14	lf	612	4.80
VCP, SS, 15",			
depth, 0-6	lf	332	4.00
6-8	lf	183	4.20
8-10	lf	219	4.60
10-12	lf	431	6.00
12-14	lf	118	7.50
ES, 15",			
depth, 0-6	lf	346	6.60
6-8	lf	106	6.30
8-10	lf	101	5.50
CMP, 16 ga, 15"	lf	35	10.30
CIP, force main, 4"	lf	1,194	2.60
6"	lf	460	3.30
jacked, 8"	lf	144	27.00
10"	lf	56	31.00
12"	lf	98	36.50
16"	lf	92	46.00
Manholes	ea	115	235.00
Street crossing, jacked	ea	18	700.00
Wyes, 6" on 8"	ea	539	2.50
6" on 10"	ea	63	3.70
6" on 12"	ea	45	4.30
6" on 15"	ea	7	8.30
Stubs, manhole	ea	60	6.00
Risers	ea	8	30.00
1 ft	ea	11	5.00
Inlets, drop	ea	12	100.00
Lampholes	ea	13	37.85
Manhole, #4	ls	job	635.00
X ing, Grubb's creek	ls	job	975.00
Blue creek	ls	job	795.00
Lift station, La. St.	ls	job	8,000
Urbana Rd	ls	job	7,200
Pavement repair, PC	sy	80	12.00
AC	sy	580	4.00
Rock, crushed	t	500	10.00
Alternate—Using flex compr jts			
on 8" pipe	lf	26,410	+0.10
10" pipe	lf	3,602	+0.40
12" pipe	lf	3,280	+0.45
15" pipe	lf	1,836	+0.90

* awarded

ENR Constr. Cost Index (1913=100) 20-cities avg.—853.64

Four-Span Georgia Bridge Is Almost a Toss-Up

Only $20 separated the low and second low bids for a Georgia State Highway Department contract in Banks and Franklin counties. Herrington Construction Co., Alma, Ga., with a bid of $69,456, squeezed out J. Nick Jordan of Atlanta by this slim margin. Herrington was 10.4% under the high of six bidders, and 8.5% below estimate.

This 240-ft bridge, on a 5 deg horizontal curve, and a 40 deg skew, will have four 60-ft wide flange spans, one concrete pier and four H-pile bents. Clearance is 25 ft above the water; roadway is 26 ft with a concrete floor and handrail.

Wage rates include: common, $2.00/hr; structural ironworkers, $3.70.

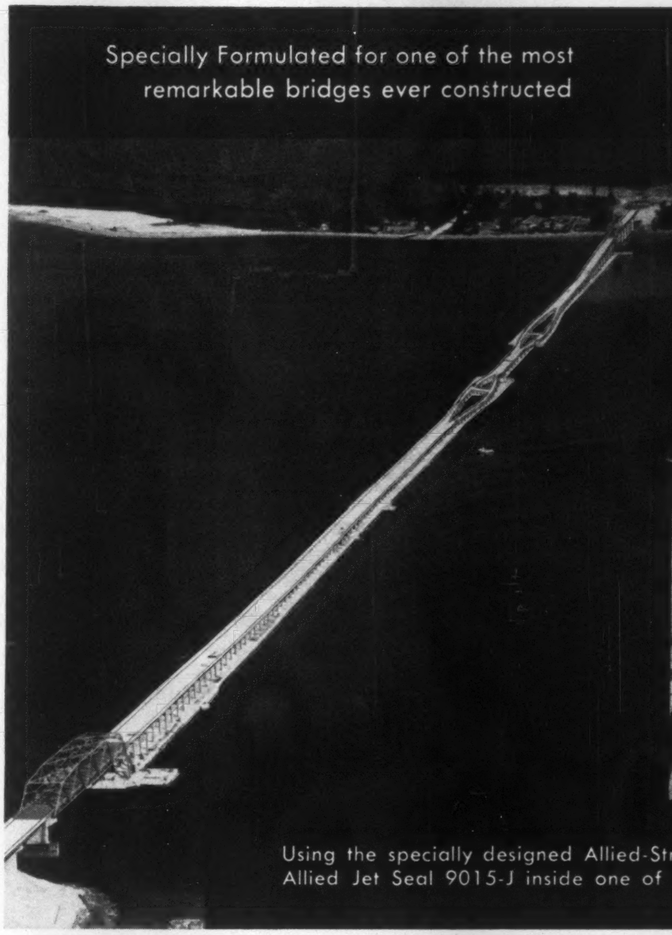
The bidding included:

1C	Herrington Const. Co., Inc., Alma, Ga	$69,456
2	J. Nick Jordan, Atlanta, Ga	69,476
6	South Atlantic Const., Inc., Greenwood, S. C.	77,560
EE	State Highway Department	75,900

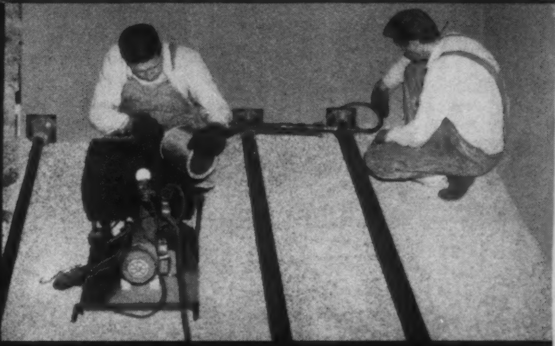
Bids: 7-28-61 Items	Unit	Quantity	Unit Prices 1 C	 2
Conc, superstructure	ls	job	$14,500	$14,000
Steel, reinf, superstructure	ls	job	6,400	6,500
structural	ls	job	20,000	19,500
reinf bar	lb	16,038	0.12	0.13
Conc, class A	cy	132	60.00	57.00
handrailing	lf	466	5.00	5.50
Excavation, bri # 1	cy	100	15.00	20.00
Clear & grub, bri site, 0.441 acres	ls	job	750.00	800.00
Piling, steel H,				
12" @ 53 lb	lf	310	6.25	5.75
10" @ 42 lb	lf	680	5.25	5.00
test, 10" @ 42 lb	ea	2	500.00	500.00
Loading test, on 10" pile	ea	1	1.00	10.00
Steel, str squay bracing	lb	2,150	0.30	0.35
Riprap, sand cement	sy	1,860	......	......
stone	t	1,163	6.00	6.50

ENR Constr. Cost Index (1913 = 100) 20-cities avg.—853.64

Specially Formulated for one of the most
remarkable bridges ever constructed



ALLIED
JET SEAL 9015-J
chosen for the $27 million HOOD CANAL BRIDGE



Using the specially designed Allied-Stroud Applicator Model 1691-J, workman apply Allied Jet Seal 9015-J inside one of the giant pontoons of the Hood Canal Bridge.

Allied Jet Seal, Product 9015-J—the superior polysulfide, polymer, elastomeric sealant—was developed especially for sealing work on the new Hood Canal floating bridge near Seattle, Washington.

The floating portion of Hood Canal Bridge spans 6,470 feet of the bridge's total 7,866 foot length, and is composed of 23 concrete pontoons—most of them 360 feet long and weighing over ten million pounds each. These pontoons carry a Washington State highway twenty feet above the water.

Some 159,000 feet of 2½-inch stressed steel cables pass through bulkheads and endwalls in the underwater portions of the bridge. These cables are sealed to the giant pontoons with more than 4,000 gallons of Allied Jet Seal 9015-J.

Jet Seal 9015-J was selected for its complete and positive adhesion after immersion in water for long periods of time, and for its ability to meet high expansion and contraction factors.

Howard, Needles, Tammen and Bergendoff supervised construction for the Washington State Toll Bridge Authority. General contractor: Yuba Erectors Division of Yuba Consolidated Industries, Inc. Charles R. Watts Company, Seattle, was sealing contractor for the project.

For more information about Allied Jet Seal 9015-J and the complete Jet Seal story, write:

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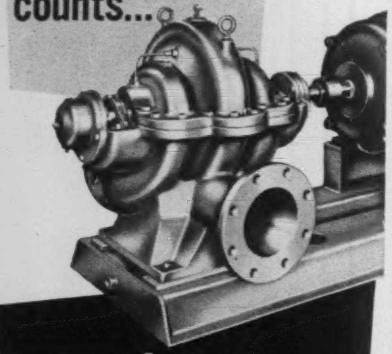

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Labor costs account for 38% of . . . .

Ohio Water Main Contract

Bidding separately on labor and materials and coming up lower than the next bidder on both prices, Glenn Rhoades Construction Co., Mt. Orab, Ohio took this water main award for $125,730. Alfred Le Feber & Associates, Cincinnati, are the engineers.

The Rhoades bid is 3.5% under The Byrnes-Conway Co., Cincinnati, and 15% below the high of four. Rhoades' labor bid is 16% under the second low, but 17% above the high bidder.

Cast iron pipe (class 150, A.S.A. 21.6, 21/45000 mechanical joint) accounts for 64% of the job's price including both materials and labor.

Wages include: skilled, $3.90/hr; semi-skilled, $3.125; common $3.025.

The bidding included:

1C	Glenn Rhoades Const. Co., Mt Orab, Ohio	$125,730
2	The Byrnes-Conway Co., Cincinnati, Ohio	130,428
4	R. P. Caffrey Co., Springfield, Ohio	148,101
EE	Alfred LeFeber & Associates, Cincinnati, Ohio	130,825

Bids: 8-21-61 Items	Unit	Quantity	Unit Prices 1C	2
CIP, cl 150, 6"	lf	10,100		
M			$2.00	$1.88
L			1.30	1.91
8"	lf	4,800		
M			2.75	2.50
L			1.40	2.01
12"	lf	4,500		
M			4.70	4.18
L			1.60	2.11
Fittings, CI	t	14		
M			400.00	336.00
L			100.00	110.00
Valves, gate, 6"	ea	55		
M			55.00	52.90
L			10.00	17.73
8"	ea	10		
M			83.00	82.25
L			20.00	60.00
10"	ea	2		
M			130.00	128.75
L			25.00	262.00
12"	ea	2		
M			165.00	162.50
L			30.00	20.00
Tapping sleeve & valve, 12" x 6"	ea	4		
M			165.00	175.00
L			200.00	150.00
10" x 6"	ea	1		
M			155.00	165.00
L			200.00	135.00
8" x 6"	ea	1		
M			115.00	150.00
L			200.00	130.00
6" x 6"	ea	1		
M			105.00	150.00
L			200.00	130.00
Valve boxes	ea	70		
M			10.00	10.00
L			5.00	5.00
Valve box extensions	lf	100		
M			12.00	3.30
L			8.00	1.00
Hydrants, fire	ea	45		
M			140.00	137.00
L			30.00	47.78
Pipe, encasement, intall only 18"	lf	85		
M			10.00	3.00
L			10.00	4.00
Service branches, new, ¾"	ea	25		
M			15.00	50.00
L			30.00	45.00
existing reconnect	ea	170		
M			5.00	10.00
L			30.00	15.00
Paving, concrete	sy	400		
M			2.00	4.00
L			4.00	6.00
Bit surfacing, T-35, 2"	sy	600		
M			1.00	0.60
L			1.50	0.70
Base course, stone, B-19, 4"	cy	80		
M			2.50	3.80
L			4.00	3.60
6"	cy	250		
M			2.50	3.80
L			4.00	3.60
Street restoration, stone, B-19	cy	150		
M			2.50	3.80
L			4.00	3.60
Excavation, extra	cy	100		
L			0.50	3.00
Concrete, extra, cl 1	cy	5		
M			18.00	17.00
L			30.00	18.00
cl 2	cy	5		
M			18.00	16.00
L			30.00	19.00
cl 3	cy	100		
M			18.00	15.00
L			30.00	20.00

all furnish and place unless otherwise noted
M materials L labor
Completion time: 250 calendar days
ENR Constr. Cost Index (1913=100)—20 cities avg. 854.09

Washington D.C. Sewer

Washington, D. C. gets the ball rolling on its $28 million Potomac Interceptor with this award for a $4 million tunnel and Potomac River crossing. Black & Veatch and Burns & McDonnell, Kansas City, Mo., are the engineers.

James McHugh Construction Co. of Chicago took the award at $4,096,521, 5.4% below Bates & Rogers Construction Corp., Chicago, and 16% under the high of five bidders.

Work includes 13,620 lin ft of 78 in. dia tunnel, 3,094 lin ft of 78 in. reinforced concrete sewer pipe in the Potomac River crossing, and 1,635 lin ft of 54 in. reinforced concrete sewer pipe in open cut. Tunnel prices range from $123 to $180 a ft.

Prevailing wage rates include: common labor, $2.30/hr; carpenter, $3.725; structural ironworkers, $4.10.

The bidding included:

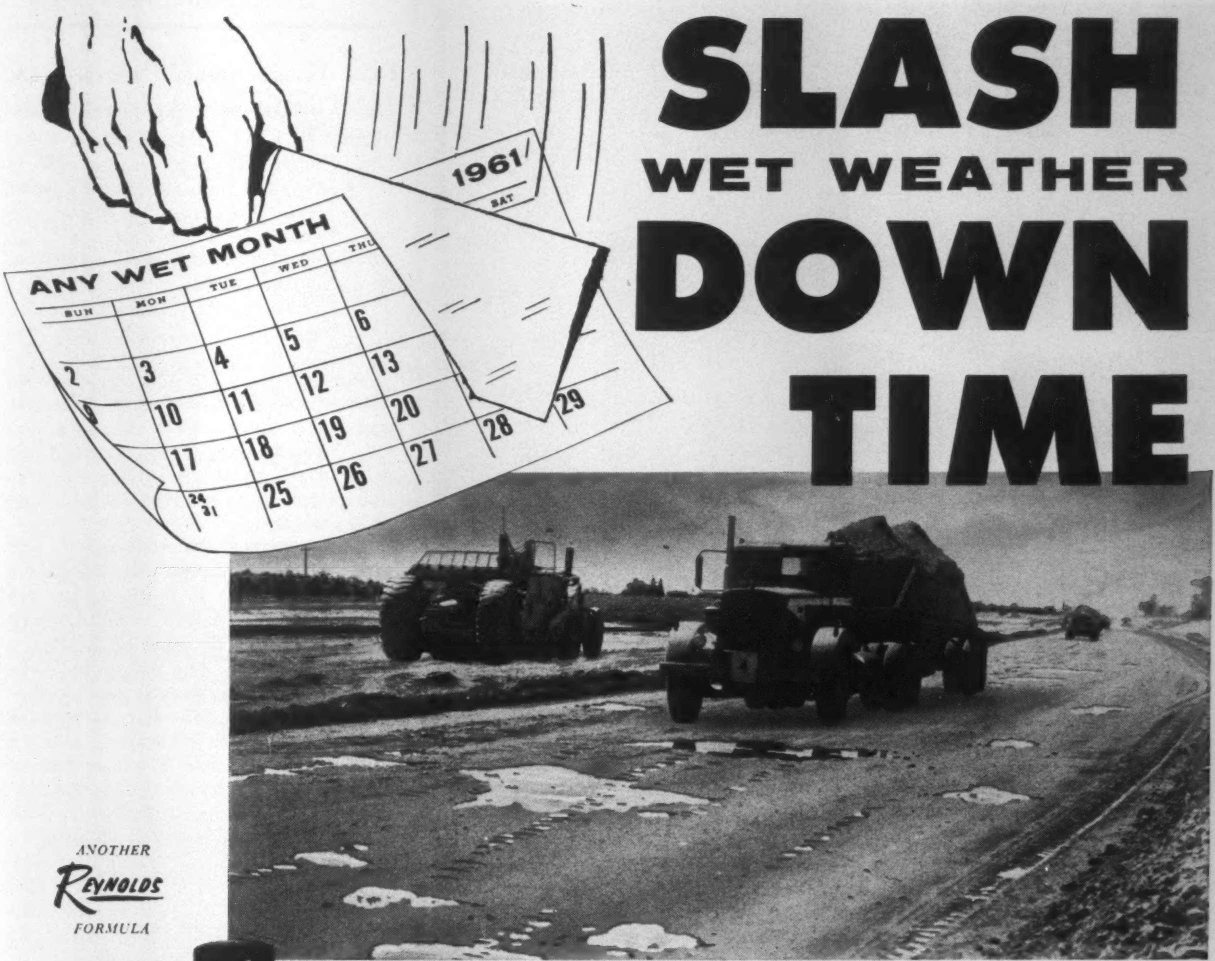
1C	James McHugh Const. Co., Chicago, Ill	$4,096,521
2	Bates & Rogers Const. Corp., Chicago, Ill.	4,328,605
5	Johnson, Drake & Piper, Inc., Minneapolis,	4,875,220
EE	Black & Veatch and Burns & McDonnell, Kansas City, Mo.	3,801,331

Bids: 8-9-61 Items	Unit	Quantity	Unit Prices 1 C	2
Portal, upper	ls	job	$119,925	$170,000
lower, and Potomac crossing	ls	job	1,522,292	1,530,000
Connect str, Pond branch	ls	job	68,860	20,000
Wells, observation,				
@550+40	ls	job	20,000	25,000
@583+50	ls	job	12,000	20,000
@645+70	ls	job	8,000	9,000
Manhole, standard,				
@1+25	ls	job	6,125	3,000
@15+50	ls	job	3,950	3,000
Tunnel	lf	13,620	148.00	160.00
Grout holes, drilling	lf	3,000	2.00	4.00
pipes, steel	ea	2,200	2.00	3.00
connect	ea	2,300	5.00	35.00
Grouting	cy	1,800	80.00	40.00
Trenching & backfilling,				
54" pipe, 0–10'	lf	165	6.30	30.00
10'–14'	lf	1,372	6.30	40.00
14'–16'	lf	40	37.80	85.00
16'–18'	lf	55	50.40	85.00
Beddings, conc pipe, 54",				
cl B	lf	125	83.00	75.00
cl C	lf	1,507	80.90	75.00
Access rd removal	ls	job	1,450	8,000

Completion: 650 cal. days... Liquid. damages: $500/da

ENR Constr. Cost Index (1913=100) 20-cities avg.—854.09

SLASH
WET WEATHER
DOWN
TIME



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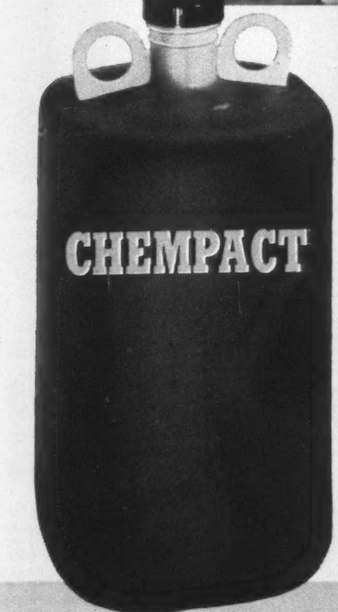

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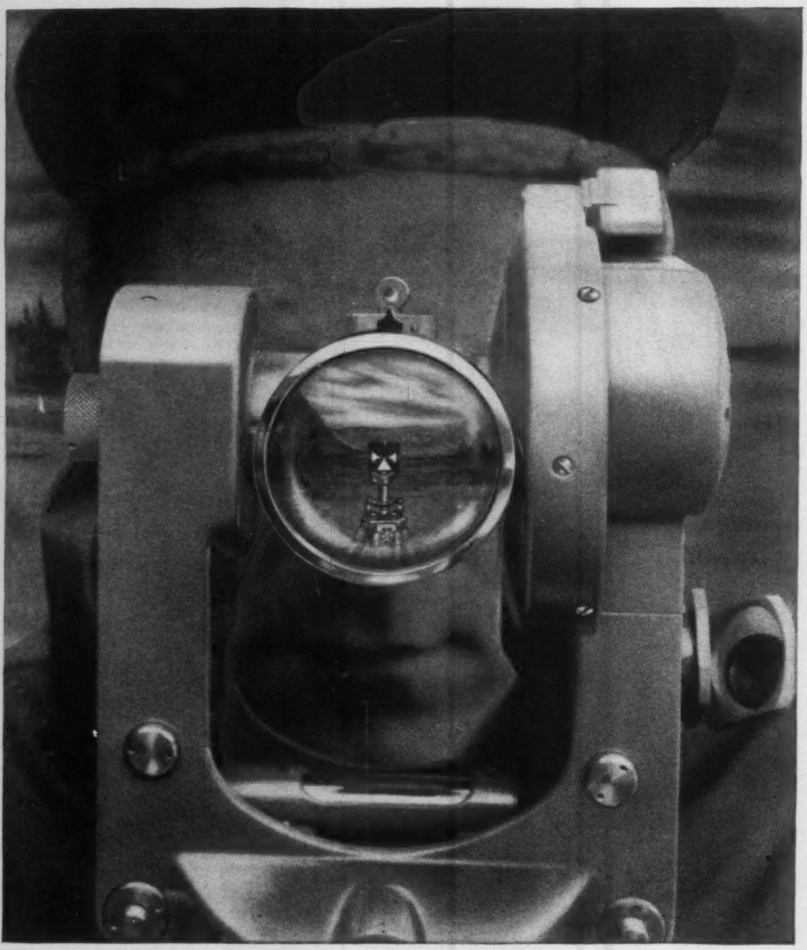

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Low Excavation Prices Key To Tennessee Airport Job

This $502,157 contract adds a 4,400 x 100-ft. NE-SW paved runway, a 4,500 x 400-ft graded area, and taxiways and apron to the Rockwood Municipal Airport, Rockwood, Tenn. John T. Talbert Jr., and Associates of Wilmington, N. C., are the engineers.

McDowell-Purcell, Nashville, Tenn., took the contract by bidding a low $0.76 a yard for 420,300 cu yd of unclassified excavation. This accounts for 66% of the job's total cost. The low was 6.1% under Ruth Construction Co., New Market, Tenn., and 24.3% below the high of six bidders. Excavation prices range from $0.76 to a high of $1.00 a cu yd.

A large part of the unclassified excavation is rock. The job site occupies a sandstone ridge in the mountainous part of Tennessee where seismographic probes indicate that much of the rock is rippable material. The topsoil has little value in landscaping.

Soil below 1,600 ft/sec will be treated as common excavation, and soil from 1,600 to 3,500 ft/sec as rock of rippable consistency. Probably much of the rock will not be pulverized but will be fractured into a state of trap-rock.

Minimum wage rates include: bricklayers, $3.25/hr; cement masons, $2.50; ironworkers, structural $3.10 and reinforcing $3.00; bulldozer operators, $2.35; earth drill operators, $2.075, and laborers, $1.35/hr; distributors, bituminous surface, $2.25; earth drill operator, $2.075; truck drivers (under 1½t), $1.48/hr.

The bidding included:

1C	McDowell-Purcell, Nashville, Tenn.	$502,157
2	Ruth Const. Co., New Market, Tenn.	534,562
6	Greer Bros. & Young, Inc., London, Ky	662,959
EE	John T. Talbert, Jr., and Associates, Wilmington, N. C	612,310

Bids: 6-29-61 Items	Unit	Quantity	Unit Prices 1 C	2
Schedule I—Site Preparation				
Clear	acre	51	$125.00	$300.00
Clear & grub	acre	46	150.00	320.00
Excavation, uncl	cy	420,300	0.76	0.80
CMP, incl end sect & elbow, 12"	lf	601	5.50	5.90
Duct, elect, U. G., 4-way	lf	56	6.00	6.00
Wind cone, airport, 12"	ea	1	1,400	992.00
Marker, airport, segmented circ	ea	1	1,300	1,800
Ditch checks & paved inverts	sf	2,500	3.00	0.85
Turfing				
Prepare ground surface	acre	51	70.00	40.00
Lining & fertilizing	acre	51	82.00	46.00
Sowing seed	acre	51	60.00	47.00
Mowing	acre	102	9.00	15.00
Refertilizing	acre	51	60.00	45.00
Reseeding	acre	20	60.00	60.00
Repairing	cy	1,000	2.50	2.00
Mulching	acre	8	150.00	130.00
Schedule II—Paving				
Aggr, crushed, base crse	cy	15,150	4.90	5.00
Bit prime coat	gal	27,500	0.17	0.17
Aggr, bit surface crse	t	7,600	5.25	6.00
Bit mat, surface crse	gal	115,000	0.14	0.15
Painting, runway & taxiway	sf	4,600	0.22	0.30

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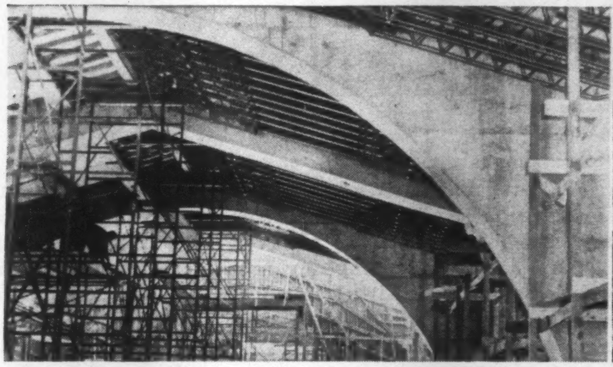
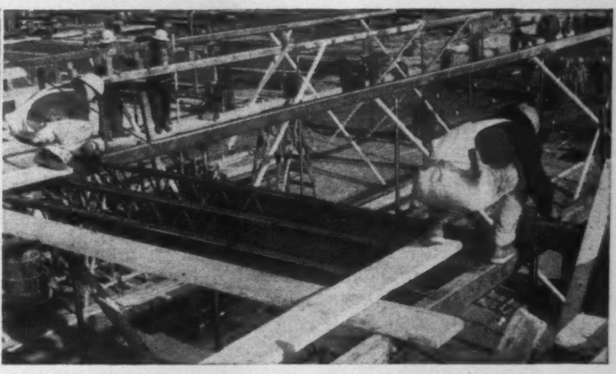
MAKES SHORT WORK OF WIDE SPANS—versatile Rex-Spanall consists of two high-strength, telescopic members. Any number of members can be assembled for any desired length. This new Jacksonville, Florida, bank building shows how clear spans up to 20 feet for ten floors were speeded by Rex-Spanall.

ADAPTABLE REX-SPANALL IS IDEAL for all kinds of construction, as this pan system in the Jacksonville bank shows. You profit from faster completion of all types of work: flat slab; flat slab with drophead; beam and slab; structural steel frame; cantilever and prestressed or precast girder.





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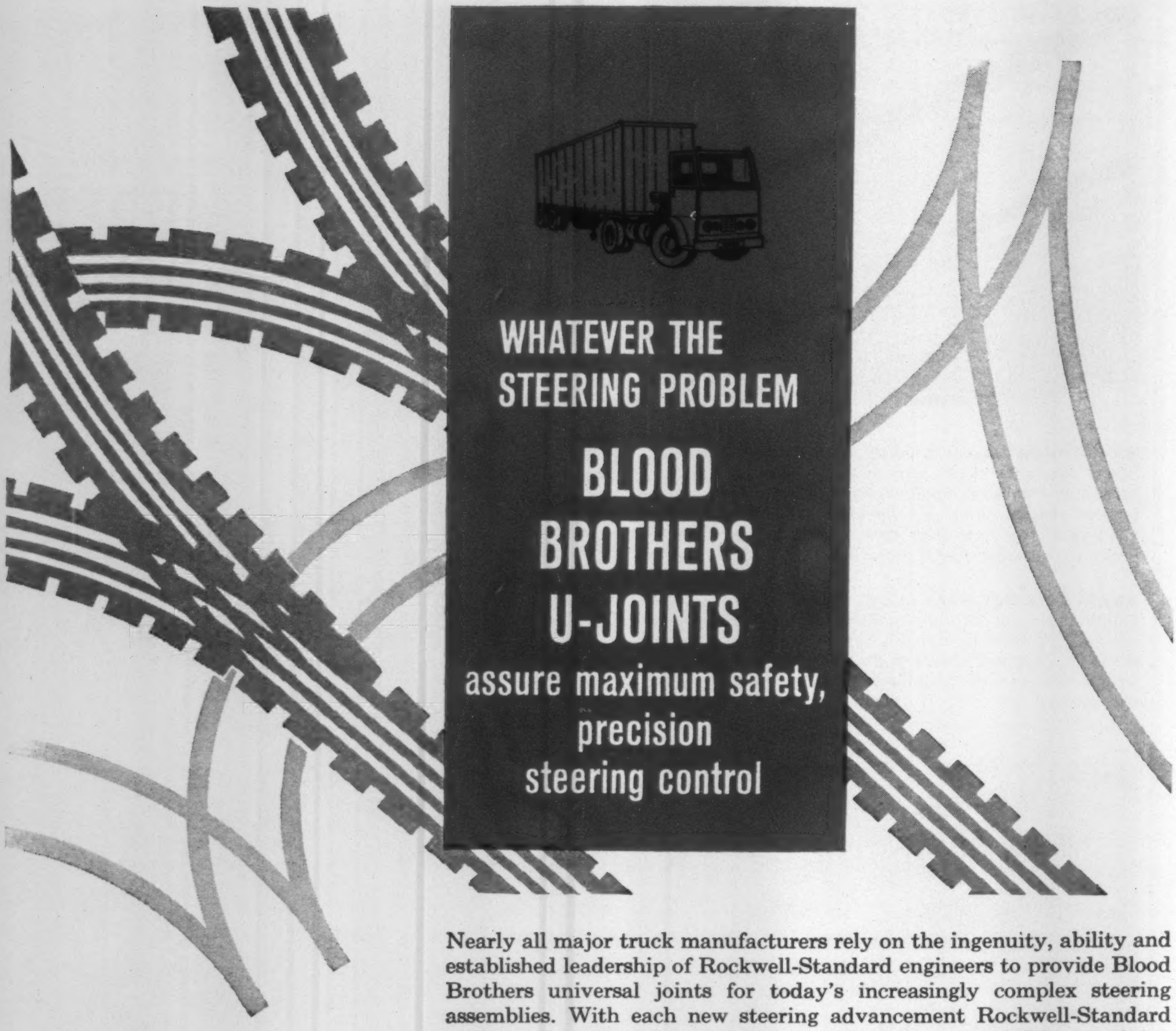


WHATEVER THE STEERING PROBLEM

BLOOD BROTHERS U-JOINTS

assure maximum safety, precision steering control

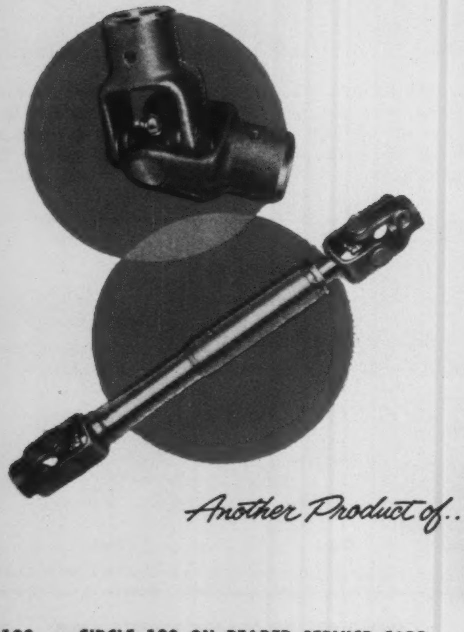
Nearly all major truck manufacturers rely on the ingenuity, ability and established leadership of Rockwell-Standard engineers to provide Blood Brothers universal joints for today's increasingly complex steering assemblies. With each new steering advancement Rockwell-Standard engineers have demonstrated their resourcefulness and skill by supplying dependable, trouble-free universal joints.

For example, the development of power steering and tilt cab trucks introduced the need for more intricate steering shaft assemblies. Rockwell-Standard engineers met the challenge with universal joints capable of transmitting power around corners without any sacrifice in operating performance or steering safety.

PARTICULARLY IMPORTANT IS THE ROCKWELL-STANDARD DEVELOPMENT OF:

- **An anti-backlash universal joint for steering columns that provides greater precision in steering control.**
- **A specially designed machine that tests every Blood Brothers steering joint at 4000-inch pounds of torque. This pre-shipment precaution insures dependable steering that cannot fail even under extreme torque pressure.**

Whatever the steering assembly, whatever problems it presents, Rockwell-Standard engineers can design and develop universal joints that are reliable, efficient and economical.



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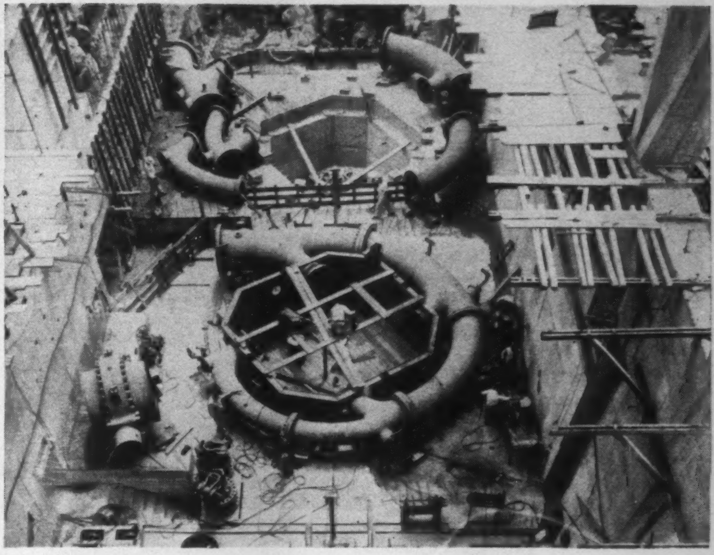
ROCKWELL STANDARD

GUADALUPE hydro plant operates on 1,450 ft head.



FIVE TURBINES for new plant are horizontal impulse type.

Colombians Tap Low-Cost Power

By Stanford P. McCasland

Two of five new generators for an addition to the Guadalupe hydro development in Colombia go on the line in March.

The expansion below Guadalupe Falls on the river of the same name is a step in an ambitious scheme to harness the first million kilowatts of an estimated 10-million-kw potential in the mountains surrounding the industrial center of Medellin in the Central Andes.

Empresas Publicas de Medellin, an autonomous public utility, is enlarging the Guadalupe plant as part of an extensive program that includes an earthfill dam with a 60,000-kw powerhouse above the falls at Guadalupe, a small arch dam to divert another river into the storage reservoir, and finally, a second earthfill regulation dam and reservoir 3.7 miles above the diversion dam.

The Guadalupe site is highlighted by the falls that cascade nearly 1,450 ft to a point just upstream of the generating plants. Penstocks for the old and new plants make the descent beside the falls. The new horizontal impulse turbines will operate under the entire head. A small dam just above the falls diverts water to the penstocks.

• Power hungry area—Medellin is a thriving industrial center with nearly 1 million inhabitants. Over the past 30 years power demand has increased at a compound annual rate of more than 15%.

In spite of its vast hydro resources, Empresas has not been able to build fast enough to keep up with such growth. Some of the larger industries have constructed their own power plants, which generally operate on byproduct steam.

The present over-all capacity in the area is about 200,000 kw—far below the present and potential demand—and the utility must severely restrict the use of power.

But the deficiency will be short-lived. The first two 44,000-kw units at Guadalupe will go on the line in March. Three more units will be activated during the succeeding three years.

A million-cu-yd earthfill dam is well under way at Troneras Rapids about a mile and a quarter upstream from Guadalupe Falls. Troneras Dam will provide seasonal storage and have a 60,000-kw powerhouse. Two 20,000-kw units are set to go in service in 1963. The dam will be finished in mid-1962.

North and west of the Troneras site is the Tenche River. A small arch diversion dam is under construction on the Tenche. It will supplement normal flow into the Troneras Reservoir by shunting additional water from the Tenche through a 2.5-mile tunnel also under construction.

• Low-cost power—Contracts already let and equipment already purchased verify that total cost of all works in the 128,000 kw of capacity now under construction will be less than $170 per kilowatt. This includes a switch-yard transmission lines, a step-down terminal substation, engineering, access roads, right-of-way, and interest charges during construction.

Empresas provides electric service to Medellin at an average retail rate of 7.5 U. S. mills per kwh. The organization is managed by Luis Eshavarria-Villegas, an industrialist who formerly attained prominence as president of the country's leading textile company.

• An eye to the future—The projects now under construction are expected to meet demands through 1967 or 1968. But Empresas is looking ahead 20 years.

A development on the Nare River south of Guadalupe and east of Medellin is in the early planning stages. The Nare Development involves a sizable earthfill dam to impound over 800,000 acre-ft. of water. Tentative plans call for an underground powerhouse that will operate under a 2,600-ft head.

This powerhouse is known as

__S. P. McCasland__ is general consultant to Empresas Publicas de Medellin. Formerly Chief Hydroelectric Engineer for Ebasco International Corp., he has worked in more than 50 countries including a four-year tour with the Corps of Engineers during World War II.

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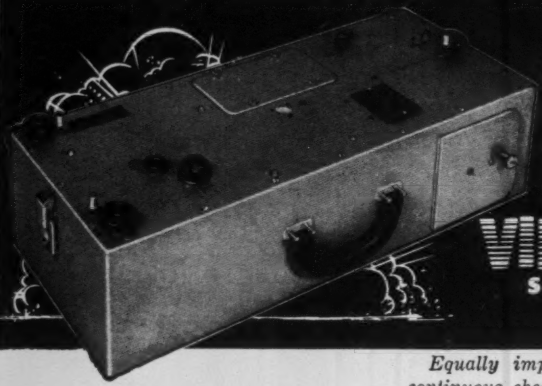

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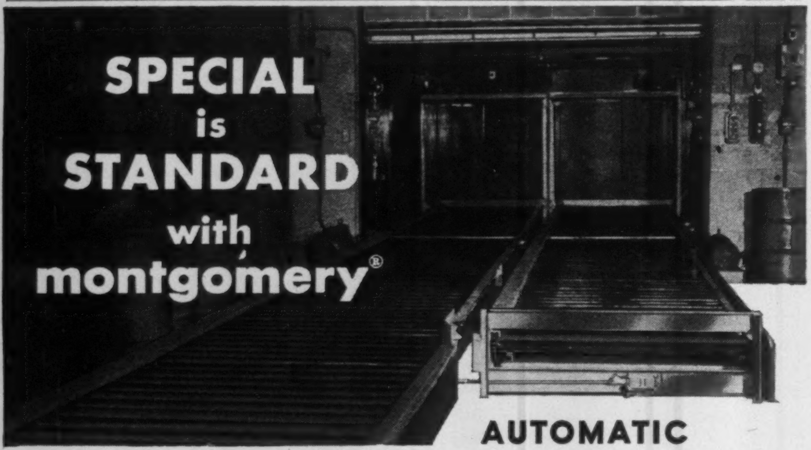

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Design and construction of unusual industrial elevator installations such as these palletized material handling units are regular events for Montgomery engineers. Equally unusual requirements have been met to provide elevators for giant testing machines; for cross-over bridges; for the nation's leading parking garages. Unusual, yes, but you can depend on Montgomery for all types of elevators, including attendant and self-operated electric and hydro-electric passenger and freight elevators.

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Guadalupe and will have an initial capacity of 500,000 kw. Cost here is expected to run less than $200 per kilowatt and bid invitations are planned for 1963.

The World Bank (International Bank for Reconstruction and Development) together with Continental Illinois, First National City, Marine Midland, and Grace National have loaned a total of $34 million for the Guadalupe, Tenche and Troneras projects.

Contractor at Guadalupe is Campenon Bernard, Paris and Caracas; at Troneras Dam, Brown & Root, Houston, Tex.; and at the Tenche Diversion project, Norconstruction, Oslo, Norway and Rio de Janeiro.

British Let Contract For Tunnel Under Tyne

The British Ministry of Transport has awarded a $15-million contract for construction of the mile-long main bore of the Tyne Road Tunnel to Edmund Nuttal, Sons and Company, Ltd. of London.

The cast-iron lined tunnel will connect Wallsend, Northumberland County, and Jarrow, Durham County in northeast England. It will have a 24-ft roadway and is designed to relieve traffic on the Newcastle bridges. It is located east of a pedestrian and cyclist tunnel completed in 1951.

The contractor will begin construction this fall on the five-year project, working from both banks of the Tyne River. Completion is scheduled in five years. Consulting engineers are Mott, Hay and Anderson of London.

An estimated $20 million more will be spent on the tunnel lining, roadways, ventilation, drainage and approach roads. Contracts for these will be awarded later.

Radioisotopes Locate Conduit Obstructions

Radiation gages may soon be part of the electrician's tool kit, because they can help save time and money.

Electricians working on a large office building in Eindhoven, The Netherlands, found that radiation monitors could locate exactly points where electric conduit was plugged with concrete during floor construction. They placed a radioactive isotope on the end of a steel spring and forced it through the conduit to the obstruction. By scanning the floor or ceiling with a radiation monitor, they located the radioactive source and thus the obstruction.

Because thicker concrete will absorb more radiation, the depth of the concrete breakthrough can also be determined by the intensity of the radiation.

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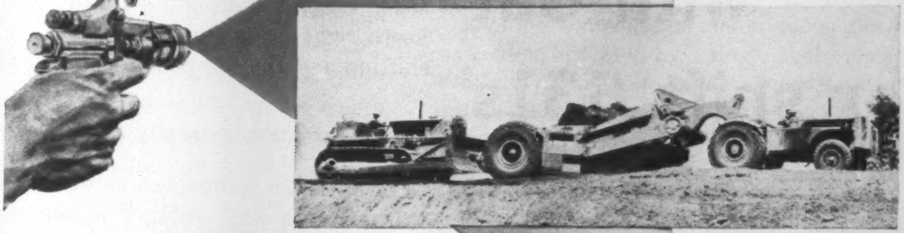

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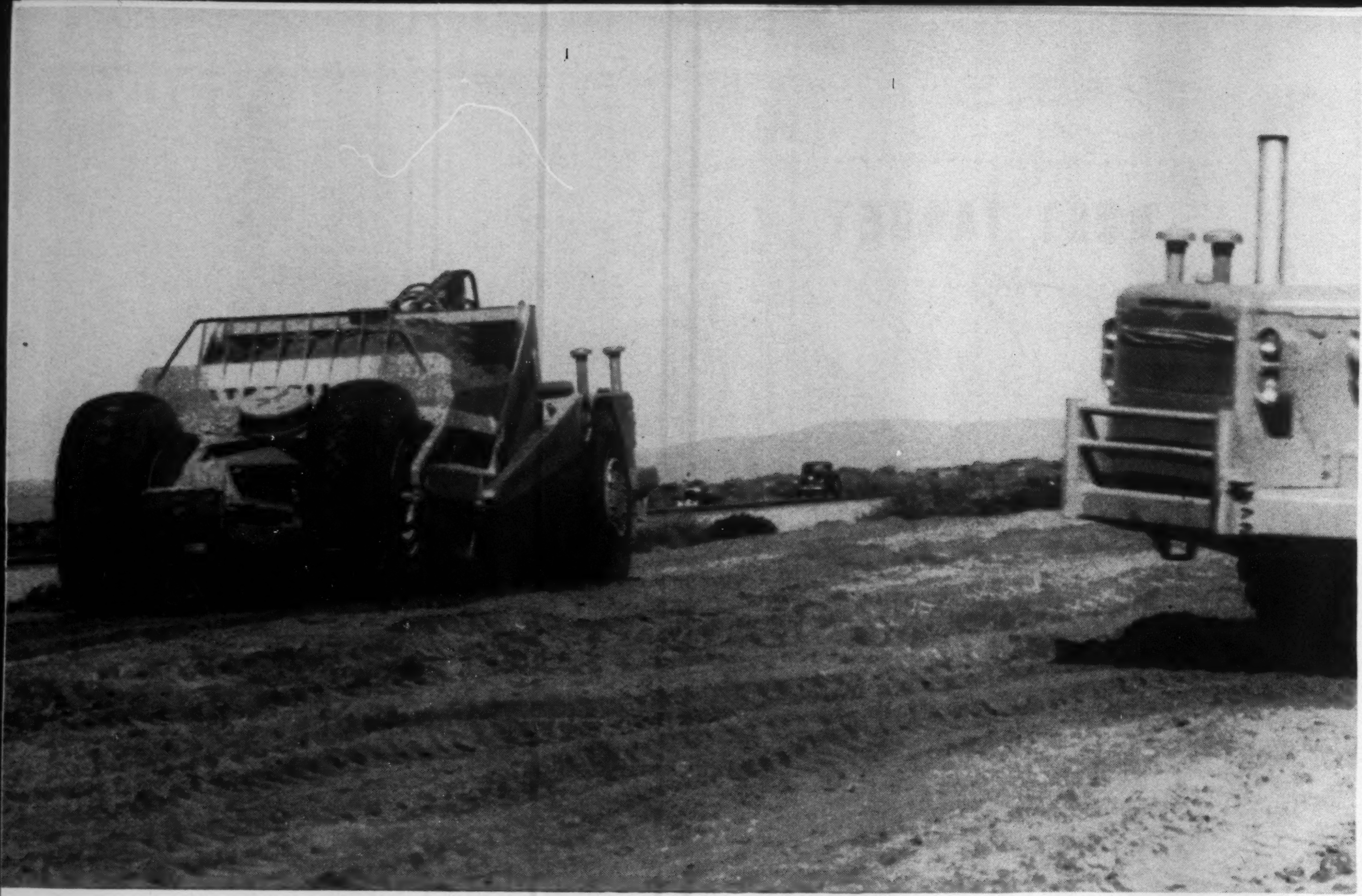


Three-to-two production payoff with Cat power shift 631s

"I get three trips to every two of (another type power shifting scraper) on a half-mile haul," says Arthur Fleming, operator for Armstrong & Armstrong, of Roswell, N. M. They added three 631s to their fleet in February and put them right to work on a road job near Las Cruces. This payoff is typical of other contractors on job after job, where results—not claims—do the talking. Check other results on this job.

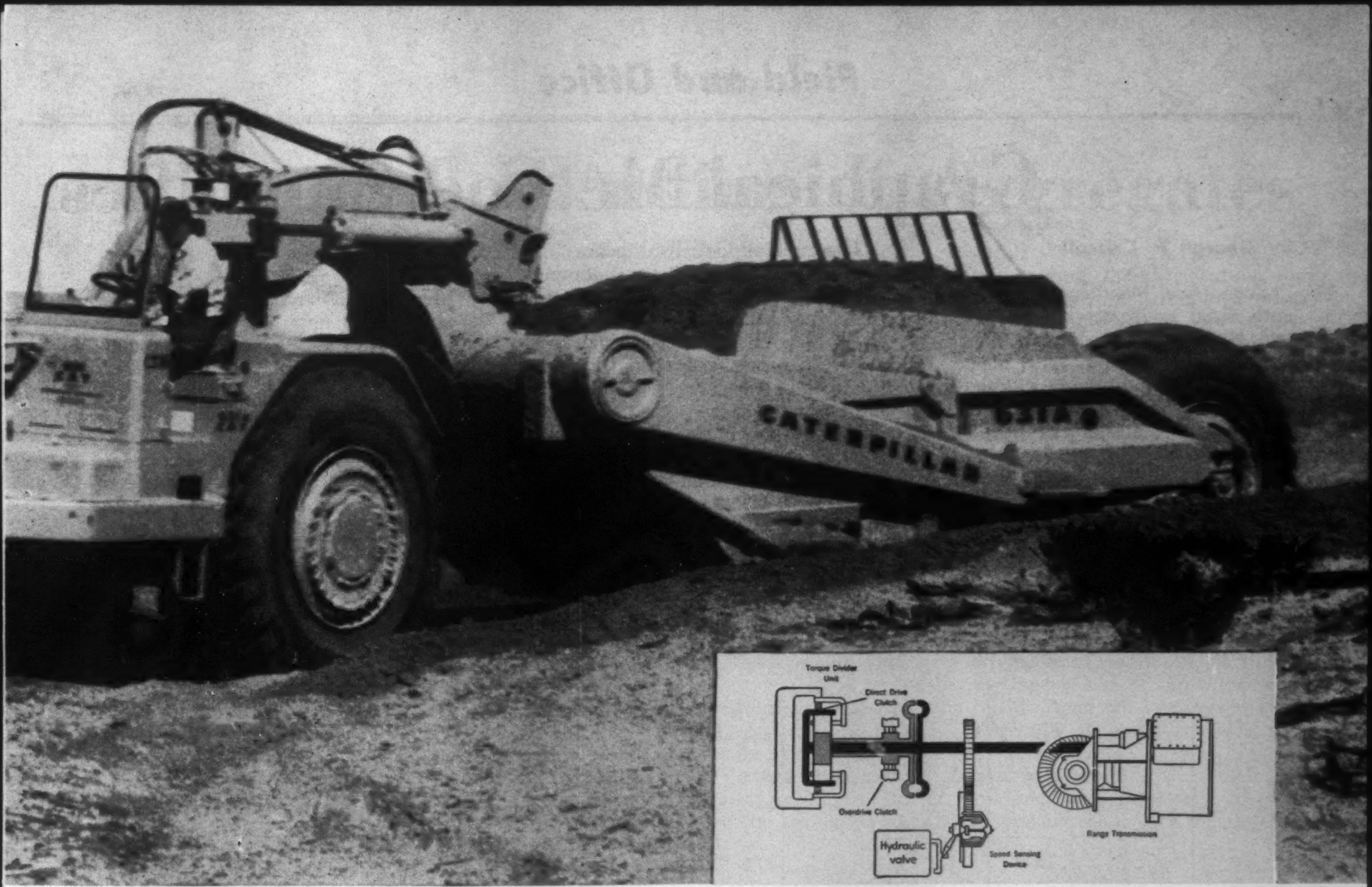
"Leaving the pusher, I can shift right up to second range within 150 feet," Fleming adds. "I just floorboard it, and the engine winds right up. In a couple hundred more feet I can shift up to third range. It has so much power it's rarely in torque divider drive (see INSIDE STORY), even carrying a big load in this sand.

"Between the power and the automatic shifting, this is a snap to run. It works great on the fill, too. I have to get an even spread to meet state specs (4-inch compacted lift). I just head down the fill and watch the scraper to dump evenly. If it hits a soft spot, the machine shifts down automatically and keeps right on going. I don't have to worry about shifting and the scraper doesn't bog down."

Power automatically matched to the job

What's the difference between Cat power shift transmissions and ordinary power shifts? Basically, the Cat unit matches power *automatically* to job conditions. It's the only unit that gives you a torque converter's ability to balance speed and torque to suit underfoot conditions, but it cuts it out for high-speed operation on the haul road to give you more efficient direct drive and overdrive. Results: faster cycles and higher production.

But *job-matching* power and *efficient* high speed are just two of the advantages designed into the power shifting 631s. Full unit construction allows every major component to be serviced without disturbing adjacent units. For example, the torque



divider transmission is removable without disturbing the engine.

31 MPH+smooth ride gives high usable speed

The 631A, powered by a turbocharged, after-cooled 420 HP engine and carrying 28 yds. heaped, has a high usable speed of 31 MPH. Smooth ride is important in being able to use this speed. Bill Botwinis, chief engineer for Armstrong & Armstrong, commented, "I'm amazed the operators can stay on these machines as fast as they go over the rough spots. They slow down the other machines, but not the 631s. They just don't bounce so much."

Want more proof how the 631 can outproduce, at lower cost per yard, any other machine in its class? See your Caterpillar Dealer!

Caterpillar Tractor Co., General Offices, Peoria, Ill., U. S. A.

CATERPILLAR

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PRODUCE MORE AT LOWER COST WITH A POWER SHIFTING 631

INSIDE STORY on the Cat power shift transmission...nine speeds with just three shifts

Cat power shift transmissions for wheel tractors match power to job conditions by automatically shifting—up or down—through three types of drives in each of three selected speed ranges. Results: nine speeds with just three shifts.

A range transmission mounted on the rear of the machine is operated by a single control lever. This one lever gives you three forward ranges, reverse, neutral and a special load range.

Automatic shifting is accomplished in the torque divider unit by a simple mechanical speed sensing device and a hydraulic valve actuating clutches. The 631 starts moving in torque divider drive, a combination of torque converter and direct drive. As speed picks up, the hydraulic valve engages a clutch to shift from torque divider drive to direct drive, locking the converter out of the system. At a higher RPM, a second automatic shift takes place—from direct drive to overdrive. If the machine slows down, this process is reversed . . . giving automatic downshifting. A shift indicator (tachometer) shows when to change speed range up or down as needed.

To keep the machine at top production, just keep the accelerator floorboarded all the time. Then you'll always have the right speed and power for the job you're doing—take full advantage of the transmission designed for the machine you're using.

CIRCLE 133 ON READER SERVICE CARD

Field and Office

Graphical Method Simplifies

By George F. Driscoll

Economical blending of three differently sized aggregates to meet a specified gradation presents a challenge to engineers, contractors and aggregate producers. Proportioning methods are available, including one presented previously by the author (ENR June 19, 1952, p. 108).

Mr. Driscoll, veteran highway engineer, teacher and contractor, now is Associate Professor of Civil Engineering at the University of Dayton.

The method described below offers advantages of simplicity and completeness. It is not necessary to make several trials; one solution shows all possible proportions. If the three available aggregates can not be proportioned to meet the specification, one solution clearly indicates that fact.

The work can be done without a scale or any computations if a T-square and triangle are used. It is helpful to use several sheets of triangular coordinate paper, transferring the limit lines to an answer sheet as developed.

The method uses gradations of the separate aggregates expressed in terms of total percentages passing each size of sieve.

The use of triangular coordinate paper is based upon the fact that the sum of the distances from any point in an equilateral triangle to the three sides is constant and equals the length of one side. In this case, the sum is 100%.

In a plot like figure 1, the point A represents 100% of Aggregate A, measured from point a; point B represents 100% of Aggregate B, measured from point b; and point C represents 100% of Aggregate C, measured from point c.

As an example of the use of the

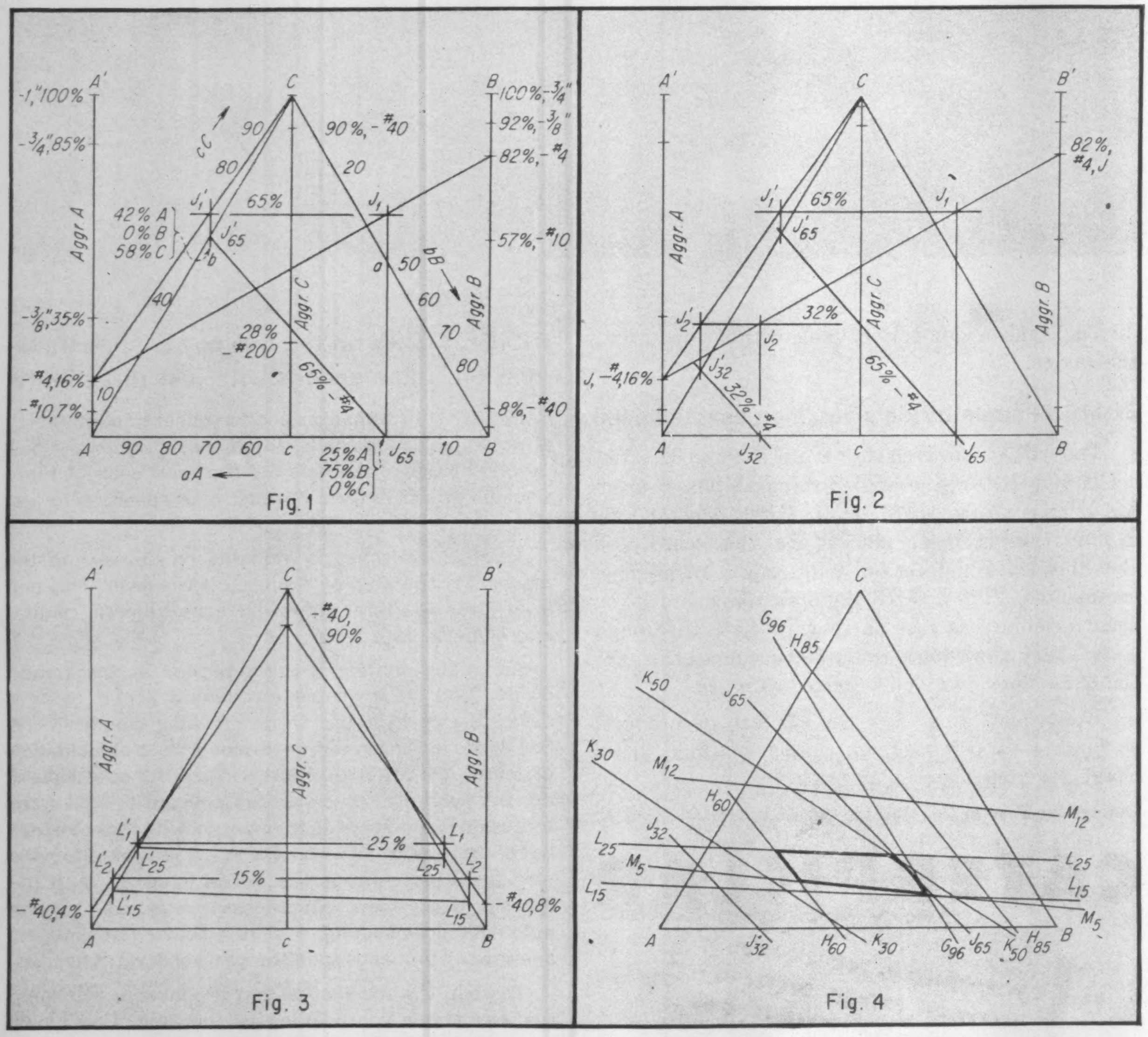

A'
C
B
-1,"100%
-3/4,"85%
-3/8,"35%
-#4,16%
-#10,7%
100%,-3/4"
92%,-3/8"
82%,-#4
57%,-#10
8%,-#40
90%,-#40
cC
90
80
40
10
20
50
60
70
80
J'1
J1
J'65
65%
42% A
0% B
58% C
b
a
bB
Aggr. A
Aggr. C
Aggr. B
28%
-#200
65%-#4
A
90
80
70
60
c
25%A
75%B
0%C
J65
10
B
aA

Fig. 1

A'
C
B'
82%,
#4,J
J'1
J1
65%
J'65
J'2
J2
32%
J,-#4,16%
J'32
32%-#4
65%-#4
Aggr. A
Aggr. C
Aggr. B
A
J32
c
J65
B

Fig. 2

A'
C
B'
-#40,
90%
Aggr. A
Aggr. C
Aggr. B
L'1
L1
25%
L'2
L'25
L25
L2
15%
-#40,4%
L'15
L15
-#40,8%
A
c
B

Fig. 3

C
G96
H85
K50
J65
K30
M12
M12
H60
J32
L25
L25
M5
L15
L15
M5
A
J32
H60
K30
G96
J65
K50
H85
B

Fig. 4

CHARTS show method of proportioning; (1) and (2) apply to —No. 40 material; (3) to —No. 4 material; and (4) gives final results.

Economical Blending of Aggregates

method, consider three aggregates, gradings for which are given in the table. The aggregates are to be combined in such proportions that the blend will meet the specification limits given in the last column.

Aggregate Gradings

Symbol	Sieve Size	Total Percentages Passing Available Aggregates A	 B	 C	Specification Limits
F	1 in.	100	100	100	100
G	¾ in.	85	100	100	75-96
H	⅜ in.	35	92	100	60-85
J	# 4	16	82	100	32-65
K	# 10	7	57	97	30-50
L	# 40	4	8	90	15-25
M	# 200	0	3	28	5-12

As a first step, erect a vertical line for each aggregate; A′A, B′B and Cc (see figure 1). Represent the grading of each aggregate by measuring the respective percentages from the base line (AcB) to the mark for each sieve size.

If Aggregates A and B are blended you can measure the percentage of A in the blend on line AcB; for a blend of A and C, measure the percentage of C on line AC; and for a blend of C and B, measure the percentage of B on line CB.

Consider that portion of the aggregates passing the No. 4 sieve, symbol J (specification limits, 32-65%). Draw a line from 16% on A′A to 82% on B′B. Blends of Aggregates A and B will yield from 16 to 82% of −No. 4 material, as the percentage of A in the blend varies from 100% to 0%.

Next, find the percentage of A required to yield 65% J by locating the intersection of the 16%-82% line with the 65% horizontal line at J_1. Project this intersection vertically to the AB line at J_{65}.

Since the line AB is 100% long, the distance J_{65}-B is the percentage of A which, when proportioned with B, will yield a blend with 65% of −No. 4.

Draw the line 16% (A′A) to 100% (Cc) in figure 1 and find its intersection J'_1 with the horizontal 65% line. Project this intersection vertically to the line AC at J'_{65}.

The point J'_{65} represents the percentage of C necessary to make the −No. 4 portion of the blend of A and C equal to 65%.

Draw a line from J'_{65} to J_{65}. This line represents numberless blends of aggregates A, B and C, all yielding 65% of −No. 4 material. Note that point J_{65} represents 25% A, 75% B and 0% C; J'_{65} represents 42% A, 0% B and 58% C.

To complete the work on the −No. 4 fraction, refer to figure 2. Intersect the 16%-100% line with the 32% horizontal line at J'_2. Project this intersection vertically to the AC line at J'_{32}, which indicates that an 81% A − 19% C blend will have 32% passing the No. 4 sieve.

Next, intersect the 16%-82% line with the 32% horizontal line at J_2.

Project this intersection vertically downward to the AB line at J_{32}, which indicates that a 76% A-24% B (0% C) blend will have 65% passing the No. 4 sieve.

Draw a straight line from J'_{32} to J_{32}. Any proportion of A, B and C represented by points on the line $J'_{32}-J_{32}$ will yield a blend with .32% passing the No. 4 sieve.

Consideration of the area enclosed by the line J'_{65} and J_{65} and the line J'_{32} and J_{32} reveals that the method is simple and complete. Any point in this area represents a blend of Aggregates A, B and C that will meet the specification for the No. 4 sieve.

Figure 3 shows how the limits of proportions to meet the specifications for the No. 40 sieve are determined using the same basic procedures.

Diagrams illustrating the work for fractions F, G, H, K and M are not shown, but all limit lines have been transferred to figure 4 to show the final results. It is unnecessary to draw any lines for the 1-in. size (F); only one line is shown for the ¾-in. size (G). The other ¾-in. line passes through point A, since 100% of Aggregate A would yield the smallest percentage passing a ¾-in. sieve.

In figure 4, the area enclosed by heavy lines is within all limits and encloses points representing all possible proportions of aggregates A, B and C that can be used to obtain a specification blend. Aggregate A can vary from 28.7 to 59.6%; B from 17 to 60%; and C from 11 to 23.5%.

If an area is not enclosed by each pair of limit lines, it is impossible to meet the size specifications with the available aggregates.

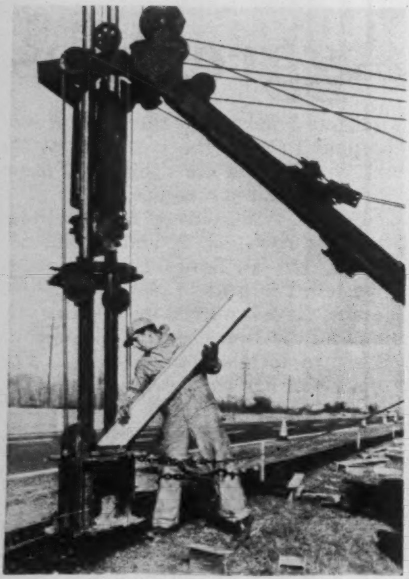
Plastic Waterproofs a Reservoir

An Arizona copper company claims to have saved $24,000 when it used this flexible polyvinyl sheet to waterproof a reservoir.

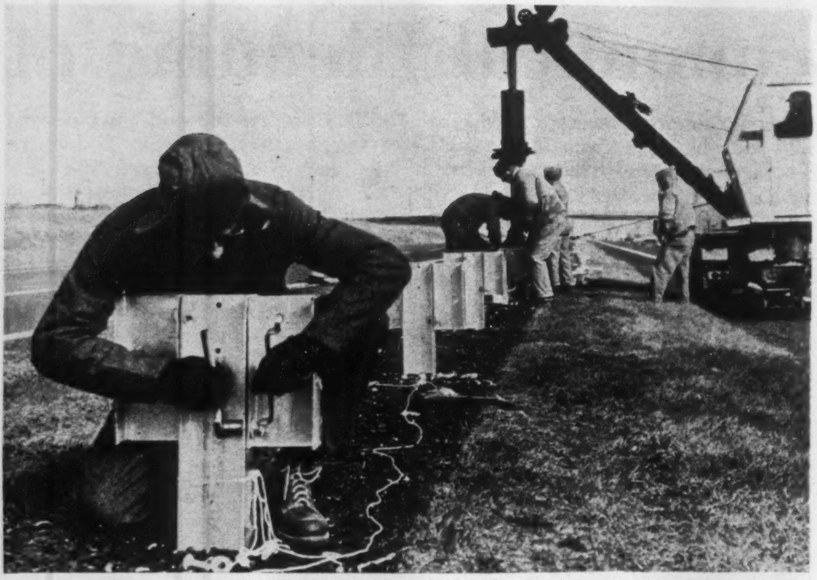
Twelve men took only 4 hours to install the 36,500 sq ft of polyvinyl sheet plastic.

The reservoir will store a dilute solution of sulfuric acid, copper sulfate and water used in copper mining and recovery operations.

Globe Linings, Inc., fabricated the one-piece liner from aluminum coated Koroseal supplied by the B. F. Goodrich Industrial Products Co., Los Angeles, Calif.



Guard rail posts go into place.



Spacers will carry galvanized steel rails on both sides.

Turnpike Installs Median Guard Rails

The New Jersey Turnpike Authority has completed installation of 87 miles of center guard rail made entirely of galvanized steel.

Two feet in height, the galvanized steel barriers on the Turnpike use 10 gage steel plates 13½ ft long, 12 in. wide and corrugated to a median depth of 3 in. to increase impact resistance. The steel stock weighs 9½ lb per ft.

Mounting posts are 5-ft, 9-in.-long galvanized steel WF flange beams. Spacers made from 9-in. long sections of the post stock are bolted to each flange at the top of each post.

First step in building a section of guard rail was to prepare a foundation strip. The strip is a 3-in. deep, 3-ft wide trench filled with bituminous macadam having 1½-in. maximum size stone.

The contractor, Whitmeyer Bros., Inc of Folsom, N. J., drove the galvanized posts through the foundation strip to a total depth of about 47 in., leaving about 22 in. protruding above the ground. Spacing of the posts was 12½ ft c-c.

Workmen then bolted the spacers on the posts, followed by the rail sections on either side. The rail sections overlap 1 ft in the direction of traffic, thus eliminating the possibility of an out-of-control car catching the end of a strip and pulling it away.

Turnpike Authority specifications required 2½ ounces of zinc per sq ft of steel surface. New Jersey Galvanizing & Tinning Works, Newark, met this requirement by a hot-dip galvanizing process.

Proponents of galvanized steel for guard rails claim advantages of high strength, resiliency and corrosion resistance; plus low initial and maintenance costs.

Fluorescent Lamps Heat Office

Illuminating engineers recommend 200 ft-c of lighting intensity for offices. This lighting generates considerable heat. Why let it all go to waste?

With this general reasoning in mind, Akron-Standard Mold Co., Akron, Ohio, built a $400,000 office building and equipped it with 279 high-output fluorescent lamps that serve as the primary heating system. Last year was one of Akron's coldest winters, yet, the integrated heating-lighting- and air-conditioning system kept the office employees well warmed.

Electric coils serve as an auxiliary heat source; no boiler, furnace or space heaters are used. Heat is obtained by pulling air past the fluorescent lamps and venting it into the office. The electric coils, mounted in the air ducts above the lamps, are used primarily to bring the temperature up quickly in the morning or to maintain minimal temperatures at night.

The 19,292-sq ft addition to Standard Mold's main plant is zone heated.

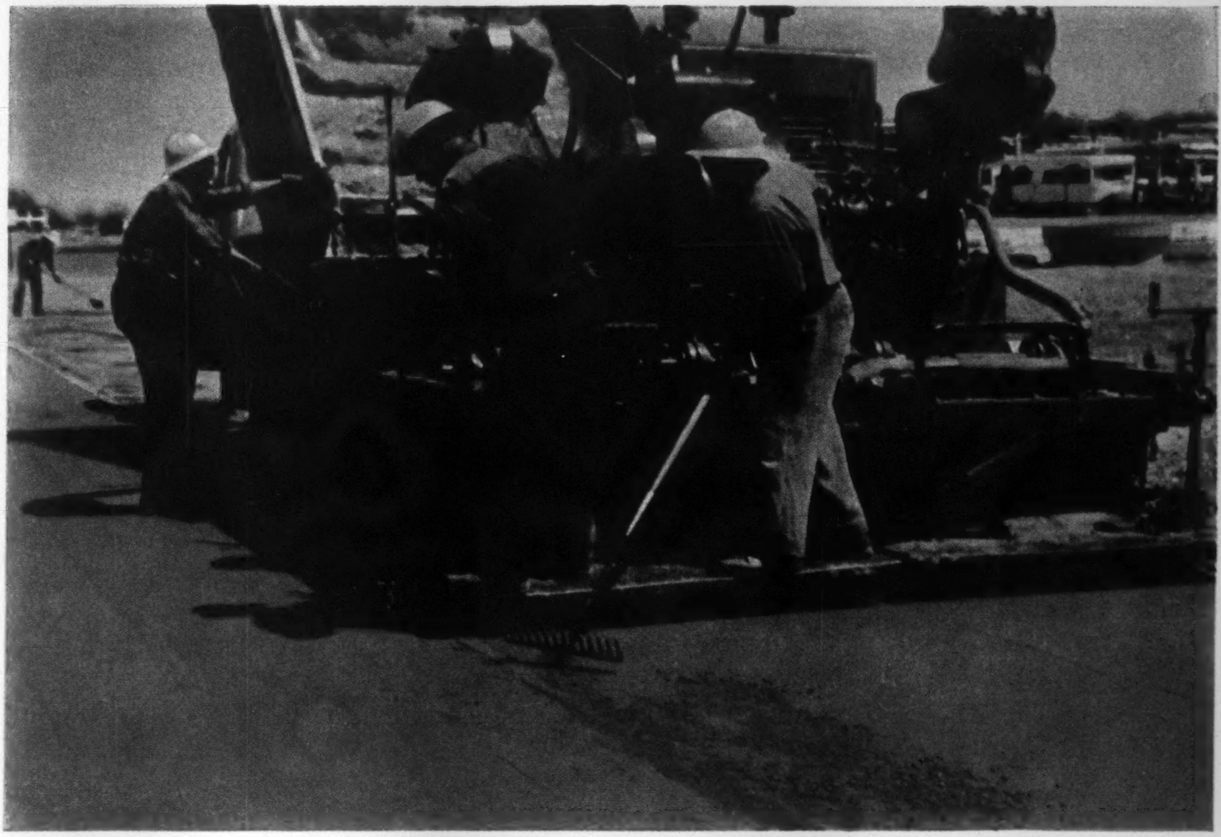
During the warm season, air drawn past the lights is vented to the outside, thus reducing the air-conditioning load. Air is cooled with a compressor of two equal stages. When the cooling capacity of one stage is exceeded, the other comes into play automatically.

The architect, Trajen Cracium, said that he encountered no radical changes in the architectural aspects of the building to accommodate the heating system.

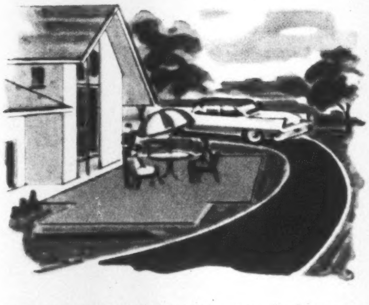
Flexible Sleeves Solve Old Pipe Fitting Problem

Short lengths of rubber hose have eliminated an old nuisance for Sayreville, N. J.'s large sewage treatment plant. The problem was pipe fittings that shake loose from vibration caused by vacuum-type chlorine gas injectors and from constant shocks from water pressure when pumps activate the purifying chlorination system.

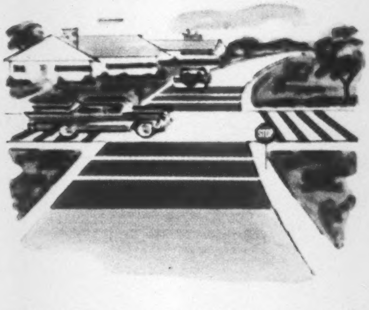
Thirty B. F. Goodrich "Flexseal" connectors were installed in the plant three years ago. The hoses, which act as shock absorbers between pumps and pipes, have given trouble free service. They are undamaged by highly corrosive chlorine solutions.



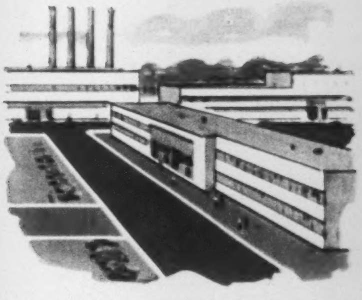
new Viadon* and Miradon* put color into paving



NEW DESIGN OPPORTUNITIES: Driveways, tennis courts, patios, pools and parking lots can now be surfaced in pleasing colors.



TRAFFIC SAFETY: Curbings, crosswalks, centerlines, speed zones and turn-offs can be permanently indicated in color.



FACTORIES: High-strength flooring in different colors distinguishes danger zones, exits, assembly areas, etc.

Viadon and Miradon, developed by Esso Research, bring you *permanently* colored paving in red, green, blue, yellow-gold and white. The color is built in—it cannot wear off. Miradon is especially recommended where high resistance to fuels and oils is needed, such as service stations and airport landing strips, loading zones and parking areas.

These remarkable new materials can be mixed in standard asphalt pugmills and laid with existing equipment. They will not set permanently in transit; can be softened by heat if desired. No special storage facilities are needed.

For more facts about this designer's dream-come-true, or for technical assistance in applying Viadon and Miradon, write us at 15 West 51st Street, New York 19, New York.

**Trademarks*

HUMBLE OIL & REFINING COMPANY Esso

THE EXTRA MEASURE

PHOTOGRAPH BY PAUL WELLER

Thoroughness. By a steelmaking specialist ■ On Lukens' 206-inch mill the world's largest steel plates are improved by the cross-rolling technique. Rolled lengthwise. Carefully measured. Turned and rolled sideways. Measured again. Lukens' cross-rolling procedure develops more uniform metallurgical properties. The extra measure of strength and quality essential to the fabricators of vital steel plate projects ■ Thoroughness is a Lukens habit, as well, in researching the best steels for difficult applications. Working with your engineers on problems of design and fabrication. Helping you select the best steel for the job from Lukens' complete line of carbon, alloy, armor and clad steel plates. Heads. Plate shapes ■ Thoroughness is one of many characteristics that make Lukens

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Contact: Manager, Application Engineering, 41-C Services Building, Coatesville, Pa.

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BIGGEST NEWS in wire rope in years!

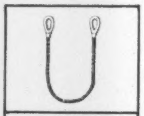
You owe it to your company to learn about Macwhyte's new 7-FLEX.® But—be prepared to change your thinking about wire rope!

You've never seen another wire rope like 7-FLEX — there is no other like it! It's an *all-purpose* wire rope, flexible as 8-strand — rugged as 6 x 19 — fatigue-resistant like a 6 x 37.

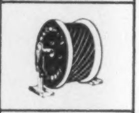
There is $16\frac{2}{3}\%$ more wearing surface in 7-FLEX than there is in a 6-strand rope. There is less unit pressure between rope and sheaves, so less rope and sheave wear. There is more sheave contact, less rope-creep. Result: longer rope life, less downtime, lower operating costs!

7-FLEX can make important savings on many wire-rope applications. Ask any Macwhyte distributor. Free Bulletin 60100-R available upon request.

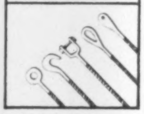
Other Macwhyte products that serve you profitably



Slings — Safe, easy-to-handle Macwhyte slings for every lifting need are available in round-braided, flat-braided, or Safe-Guard styles. Many standard designs. Also custom-made to your requirements. Send for Bulletins 5308-R and 5886.



Corrosion-Resisting Wire Rope — Many sizes and constructions in Stainless Steel, Monel Metal and plastic or nylon coated. Meet the requirements imposed by alkaline and acid conditions and marine atmospheres, temperatures, and humidity. Send for Bulletin 49-30.



Wire Rope Assemblies — Safe-Lock wire rope assemblies are precision made to your order in the size, length, and strength needed. Uniform high quality with fittings permanently swaged to the rope. Many standard designs. Send for Catalog 6101.

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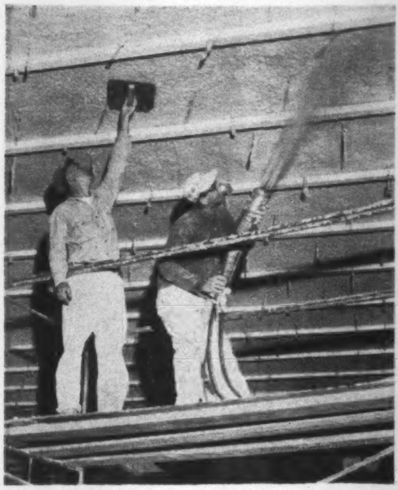

Spraying Produces . . .

Acoustical Ceiling

The sprayed-asbestos ceiling of Rutgers University's new library is a fire retardant, thermal insulator and sound absorber rolled into one material.

Sprayed, then tamped evenly to metal lath, the long-fibre asbestos has a noise reduction coefficient of 0.80 and a U factor of 0.22. It is classified as fire retardant for three hours, for $\frac{7}{8}$ in. thickness.

The 30,000-sq-ft ceiling was applied directly to lath attached to the bottom flanges of roof beams. The finished surface looks like travertine marble.

The Library-Study Center for Douglas College, the Women's Division of Rutgers University, was designed by Warner, Burns, Toan, Lundy, New York City architects. The Emjay Maintenance Corporation installed the ceiling.

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Your OWEN Clamshell Bucket starts making money for you from the first hefty mouthful it bites off . . . and keeps on making money because its rugged construction "stands up". It's the bucket with "The Big Bite that's Just Right!"

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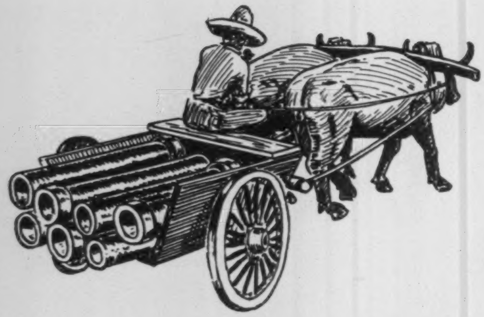

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NO-JOINT cast-in-place Concrete Pipe does it Best!

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- ***100% Perfectly Bedded, Everytime!***
- ***Lowest Installation Cost!***
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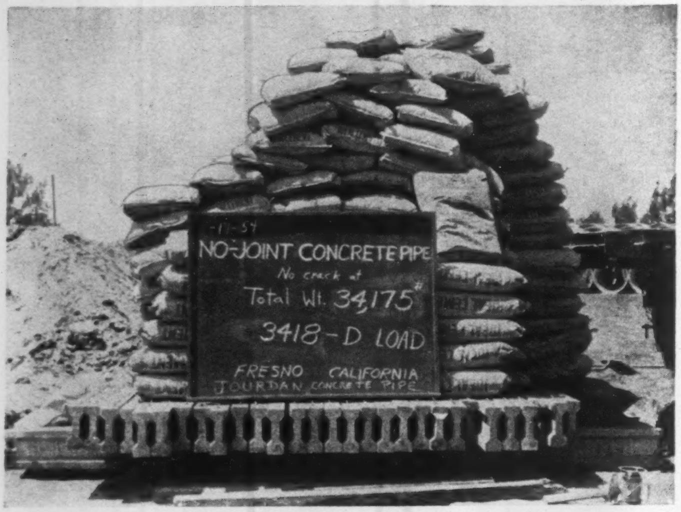

External load test on 4 ft. section of 30-inch Dia. NO-JOINT Concrete Pipe; 3418-D load without failure.

Ox cart methods of installing pipe went out with the bustle. NO-JOINT Concrete Pipe is the *modern* way to lay conduit. It is far more *efficient* and *economical;* saves *20% and more* over competitive pipe!

If you are haunted by *joint problems*—rubber gasket, slip, metal, mortared, hemp, hot poured, speedy, snap or perhaps stiff joints—NO-JOINT Concrete Pipe can solve all but the *last one!*

NO-JOINT Conduits have NO JOINTS. So your joint leak problems are *ended* for good! Think how this steps up *maintenance savings!*

Arch-design NO-JOINT pipe has other virtues, too. *Flexural strength* is uniform throughout its length. Bearing loads are *uniformly resisted.* Patented NO-JOINT process assures uniform pipe thickness. There's no chance for variations in shell strength. Sizes from 24″ to 72″ ID.

NO-JOINT Pipe is winning most of the contracts for storm drains, sewers, culverts and irrigation conduits because you can check its *quality* where it counts most—in the GROUND! *It's perfectly bedded everytime!*

Satisfied customers are using *high quality* NO-JOINT Pipe for *sanitary sewers* in Lamar, Colorado, *storm sewers* in Germiston, South Africa, and *irrigation lines* on the Parker Ranch in Hawaii. If you have need for high quality, low cost conduit, check on NO-JOINT, machine tamped and vibrated, cast-in-place concrete pipe.

ENGINEERS: Save your clients 20%, 30% and even more with cast-in-place NO-JOINT Concrete pipe!

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Nevada No-Joint Construction Co.,
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North Sydney, N. S. W.

CANADA
Keystone Contractors Limited,
P.O. Box 128, Windsor, Ont.

INDIA
Structural Engineering Works, Ltd.
127 Mahatma Gandhi Rd.,
Fort Bombay 1

SOUTH AMERICA
No-Joint Concrete Pipe De Venezuela, C. A.,
Apartado 10860, Sabana Grande, Caracas, Venezuela

ASSOCIATED WITH
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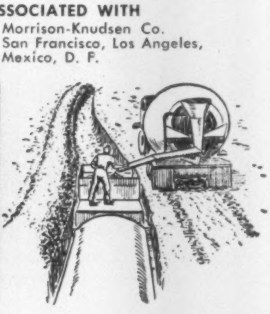
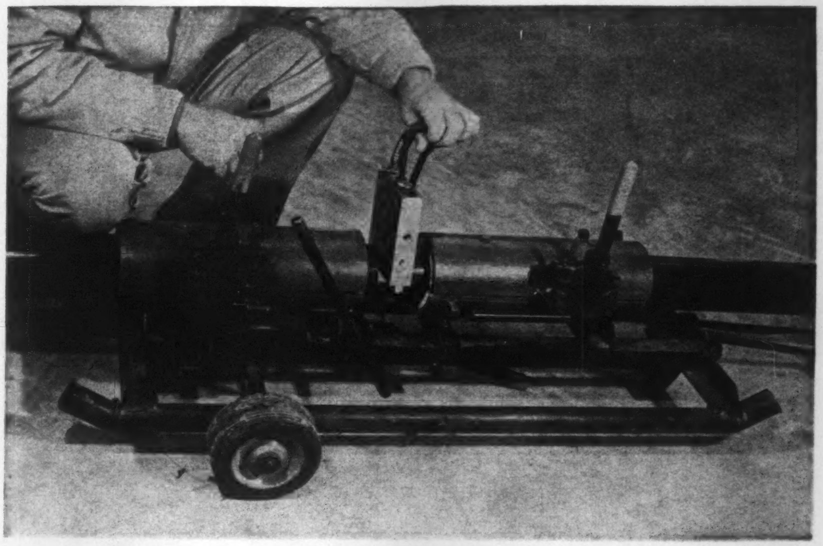
San Francisco, Los Angeles, Mexico, D. F.





Machine Joins Plastic Pipe

Phillips Chemical Co. has designed a machine that uses a new technique of joining high density polyethylene pipe They call the method butt fusion.

Procedure for making the joint consists simply of heating the ends of the pipe until they soften, then gently pressing them together. The machine designed to make the joint is said almost to eliminate the possibility of an error.

Three sizes of equipment are available for making joints on various pipe diameters. The smallest unit is used for joining 2 in. and smaller pipe. The second size joins 2, 3 and 4 in. pipe. The largest handles 3, 4, 6 and 8 in. Phillips Chemical Co., Adams Bldg., Bartlesville, Okla.

Wood Shavings Brace Partition

The latest twist in factory-assembled partitions is a curl, a hardwood shaving to be exact. Spiral shavings form the core of nonloadbearing partitions with gypsum-board facings.

These Spiral-Core partitions are designed to reduce construction time and costs and to take up little floor space. They are only 2⅜ in. thick.

Spiral-core partitions offer an impact resistance several times greater than that of wallboard between studs of conventional partitions, according to the manufacturer. They weigh only 3.6 lb per sq ft, as compared with 5.5 lb for conventional wood-stud and gypsum-wallboard construction.

Standard panels are 4 x 8 ft. They can easily be cut on the site to other dimensions.

Installation requires nailing to tracks attached to floor and ceiling. Panels are connected to each other by nailing to wood blocks that have been placed between the facings along the adjoining edges. Joints are finished with tape and cement, as in the case of other gypsum wallboards.

Simply by shoving conduit or wiring through the panels, electricians can readily install the electrical system. For long runs, a fish wire will easily puncture the curls, to make a path for cable to be pulled back through the panel. National Gypsum Co., 325 Delaware Ave., Buffalo 2, N. Y.

Vinyl Coating Compound Colors Chain-Link Fences

The chain-link fence has been glamorized. A vinyl compound produced by Union Carbide Plastics Co. adds color to drab galvanized wire.

According to the manufacturer, the coating for Colorbond fences resists a force of 3,300 psi, stretches to 290% of its original length, and can withstand 284 F and −60 F without peeling, cracking or losing its color.

The cost of Colorbond fencing is said to be competitive with bare galvanized-steel fences and as much as 50% less than aluminum. The Colorguard Corporation, 35 West 53rd St., New York, N. Y.

Three Concrete Batchers Designed for Export Trade

Three mobile batching plants, designed specifically for export, are now available. The plants, which have capacities of 30, 40 and 90 cu yd per hour, are being manufactured by the Erie-Strayer Co., and are designated as Export Mobile Plants No. 1, 2, and 3 respectively.

One of the prime considerations in design of the three plants was the packaging of units for ease, speed and economy of transport with no loss of operating efficiency. According to the manufacturer, each of the plants can be shipped overseas for as much as 30% less than conventional plants of the same capacity. And the largest plant can be sent over land on a single flat car. For overland towing, each section of each plant is rubber-mounted, and the larger plants have air brakes, lights and fifth-wheel connections.

Plant No. 1, built for bag cement, is available in either a 3½ or 6 cu yd capacities and has an inclined conveyor for loading transit mixers, and a cumulative scale for accurate batching.

Plant No. 2 is similar to plant No. 1 but contains a mobile cement batching plant with a 356 barrel capacity.

Plant No. 3 also includes an aggregate batching plant and therefore allows for bulk storage of both cement and aggregates. Erie Strayer Export Co., 75 Public Square, Cleveland 13, Ohio.

Curtain Wall Interlocks Without Nuts and Bolts

The Pac/Wall 710 series is an aluminum curtain-wall system that can be installed for an average cost of $2.30 per sq ft, according to the manufacturer.

All components are modular. They lap and interlock without nuts and bolts. Horizontal and vertical components are cut to size at the factory. The only field work required is assembly.

Designed for one and two-story construction, Pac/Wall 710 meets requirements for deflection and watertightness given in the Curtain Wall Manual of the National Association of Architectural Metal Manufacturers.

Design characteristics of the 710 series include an unbroken watertight seal throughout entire wall; lapped connections that permit expansion yet maintain watertightness; and a T-shaped mullion with a thin profile. Pacific Curtainwall, Inc., 600 West 15th St., Long Beach 13, Calif.

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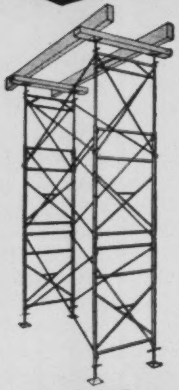
the only HEAVY DUTY fully braced "X" tendible SHORE



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COSTS { 10% to 20% less to buy
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GIVES { Easy adjustment to any height
10% to 40% more load

Now in use on 8 major bridge and heavy construction projects.

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______ Please send data on SHORE "X" Scaffold.
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Name ______ Title ______
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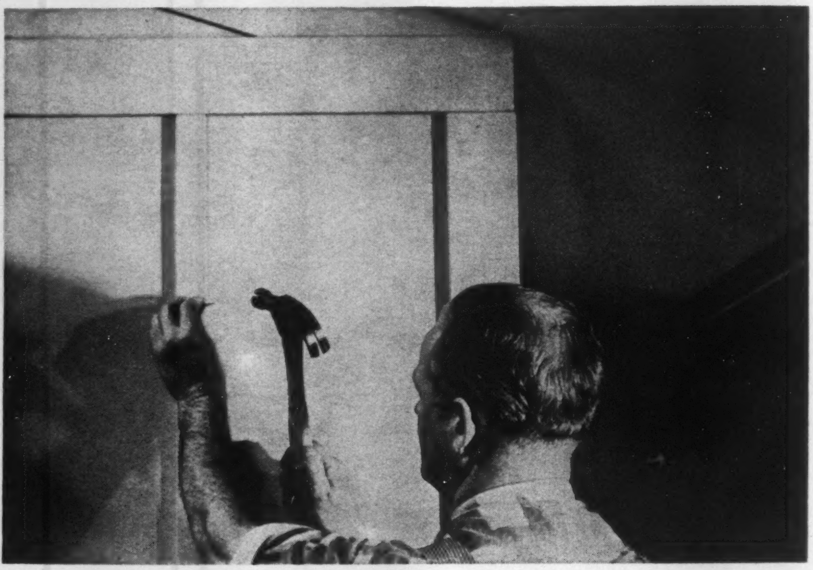
Address ______
City ______ Zone ______ State ______



Wood-Like Facing Acts Like Stone

Permatone Flexboard Trim can be sawed, rabbeted, mitered, nailed and painted like wood; but it is noncombustible, termite-proof and will not rot, crack or peel, the manufacturer says.

Made of asbestos-cement, the factory-assembled ⅝-in.-thick siding can be used wherever wood trim can be used—as battens, belts, eave trim, fascia, corner, rake and skirt boards. It is available either pre-primed or with a factory applied acrylic coating, in six colors.

Standard lengths are 8 and 10 ft, in widths from 1⅝ to 6½ in.

According to the manufacturer, the new trim meets every condition for minimum maintenance suggested by the Federal Housing Administration. JOHNS-MANVILLE, 22 EAST 40TH ST., NEW YORK 16, N. Y.

New Products Briefs

Slippery Road Warning

Kar-Trol Model KT-21 ice, snow and frost detector can be set in a roadway surface or a bridge deck and wired to illuminate automatically a slippery road warning sign when it is needed. The KT-21 can also warn of a wet road ahead. KAR-TROL SIGNAL CO., INC, 12739 SOUTH MAIN ST., HOUSTON 35, TEX.

Upright-Image Transits

Wild Heerbrugg Instruments, Inc., now have an optical repeating transit, T-1AE, and an optical transit, T-16E, with erecting image telescopes. The T-2E theodolite also includes this feature. WILD HEERBRUGG, INC., PORT WASHINGTON, N. Y.

Vane Pumps

The Vickers family of mobile vane pumps has been filled out with two additional series, Series 30 and Series 50. The three original series (25, 35 and 45) have been given increased capacities, so now the line goes from 12 gpm to 109 gpm in 17 steps. VICKERS INC., DIV. OF SPERRY RAND CORP.

Household Water Purifier

Packaged plant chlorinates household water from uncontrolled wells, cisterns, lakes or ponds. Includes self-priming ejector pump, 42-gal pressure tank and chlorinator. Filter can be provided to remove turbidity as well as objectionable chlorine odor and taste. FAIRBANKS, MORSE & CO., 600 SOUTH MICHIGAN AVE., CHICAGO 5, ILL.

Clawed Rake

Basket Rake for cleaning weeds, roots, etc. from ditches, lake fronts, rivers attaches to a ½-cu-yd machine like a dragline bucket. Weighs 1,500 lb., 9 ft. wide. INSLEY MFG. CORP., P. O. BOX 167, INDIANAPOLIS, IND.

Highway Patcher

Model HE-PR-32 Infra-Red Highway Patcher has three 26,000 BTU infra-red generators that are able to penetrate two inches of asphalt in less than four minutes. The unit, mounted on small wheels, is 24 in. x 32 in. square and will melt asphalt without burning it. CAPSAEROIL PRODUCTS CO., INC., SOUTH HACKENSACK, N. J.

Now one product cures, hardens, seals and dustproofs new concrete floors with a single application

West Chemical Concrete Floor Treatment goes right on after troweling... cuts labor costs in half

Now you can treat newly-laid concrete floors immediately after troweling with no delays for drying. No delays between treatment applications.

For West Concrete Floor Treatment cures, hardens, seals and dustproofs new concrete with a single, simple, penetrating application. Gives a thorough, deep-cure treatment which also prepares the surface perfectly for the addition of composition tile or other material.

It enables concrete to retain over 95% of its moisture. Permits a gradual and even release of moisture so that the curing, hardening and sealing processes occur simultaneously.

Just one coat of West Concrete Floor Treatment seals concrete against stains from acids, oils, and greases during the early construction phases. Protects surface from plaster, paint, mud, and abrasive traffic during final construction phases.

This remarkable time-and-labor saving treatment is as effective indoors as out. No special skill is needed to apply it. No complicated machinery or equipment. And it meets ASTM specifications C-156 and C-309.

So speed up your whole operation, cut costs in half and protect your investment by proper curing with West Concrete Floor Treatment.

The man to contact for specifications and additional information is your local West representative, or mail coupon below. West Chemical Products, Inc., 42-16 West Street, Long Island City 1, N. Y. In Canada: West Chemical Products, Ltd., 5621-23 Casgrain Ave., Montreal, P. Q.

WEST CHEMICAL PRODUCTS INC.
FLOOR PRODUCTS DIVISION

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Floor Products Division, Dept. NB1
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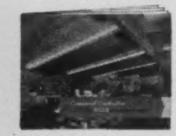
Initial Cost of Rilco Beams—
"REASONABLE"
Cost of Handling and Erection—
"FAVORABLE"

"Both the customer and ourselves are well pleased with the installation," states Grif S. Pharo, Wm. P. Neil Co., Los Angeles, contractor for the new Daetwyler Warehouse, Los Angeles. "We found the initial cost of Rilco laminated wood beams very reasonable . . . the cost of handling and erection very favorable."

Rilco laminated wood beams, arches and purlins cost less to buy, less to erect, less to maintain. Each has a high strength to weight ratio, plus offering the superior fire resistance qualities of glued laminated wood. Members are shipped to job site on time for fast erection by regular work crews—building goes up quicker, is ready for use sooner.

Rilco field sales engineers will be happy to consult with you, without obligation.



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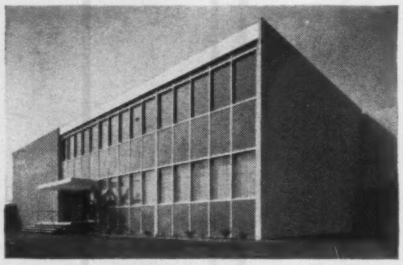


Daetwyler Warehouse, Los Angeles, Calif., constructed with 129 Rilco laminated wood beams. Contractor: Wm. P. Neil Co., Ltd., Los Angeles.

Weyerhaeuser Company
Rilco Laminated Products Division
W801 First National Bank Building
St. Paul 1, Minnesota

DISTRICT OFFICES: Linden, N.J. • Fort Wayne, Ind. • Tacoma, Wash.

New Product Briefs

Low Flow Valves

Line of valves includes five models for use in regulating flow of small streams of air, water, steam or chemical solutions. Three body sizes in 1400 series—½, ¾, and 1 in.—in full range of materials and body ratings. VALVE DIV., MINNEAPOLIS-HONEYWELL REGULATOR CO., FORT WASHINGTON, PA.

Masonry Bits

Necor bits, ½ to 1¼ in. For drilling concrete, tile, terrazzo, marble, brick and porcelain. Carbide cutting edge. Can be used with any electric rotary hand drill or drilling machine. NEW ENGLAND CARBIDE TOOL CO., MEDFORD, MASS.

Centrifugal Pumps

Line of centrifugal pumps, hermetically sealed, for use with toxic and volatile liquids. Has self-adjusting bearing. Discharges range from 1 in. to 5 in. Designed for 120 psig. at temperatures from 40 F to 250 F. BUFFALO PUMPS DIV., BUFFALO FORGE CO., BUFFALO 5, N. Y.

Materials Testing Machine

Universal testing machine for construction materials. Tests reinforcing bars No. 2 through No. 11 in tension and 6 x 12-in. concrete cylinders in compression. Capacity Model LT-800, 250,000 lb; Model LT-900, 400,000 lb. Accessories for testing blocks in compression, bricks in compression and modulus of rupture, beams in transverse loading and weldments in bending and tension. FORNEY'S, INC., TESTER DIVISION, NEW CASTLE, PA.

Pipe Wrench

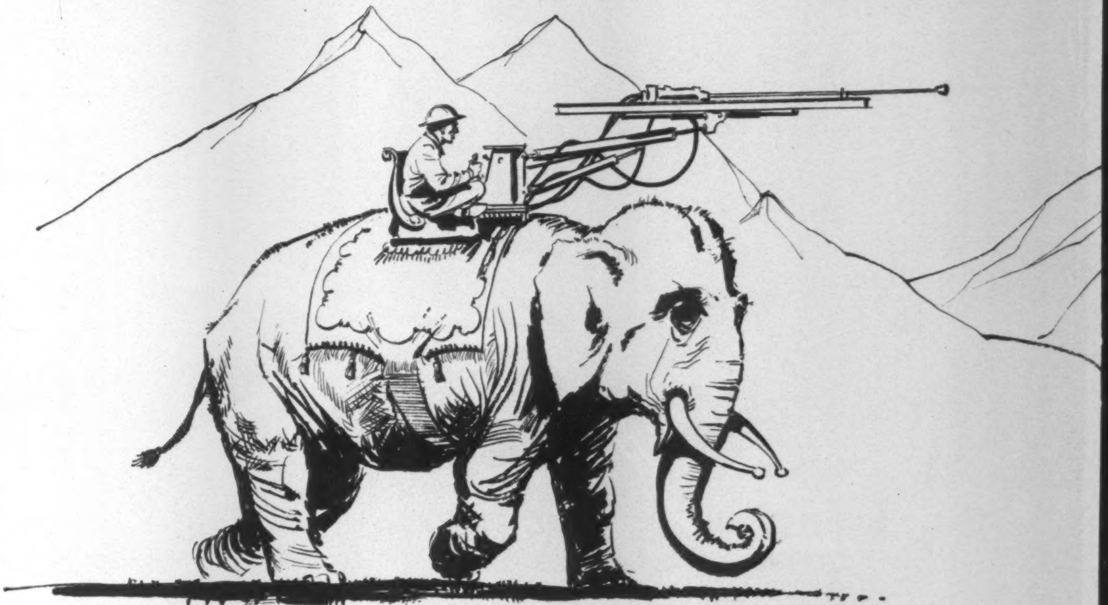
Lightweight, high-strength, Gripso-Matic pipe wrench snaps open and locks to position with spring-loaded ratchet. Adjustable jaw calibrated for fast setting. Sizes: 6, 8, 10, and 14 in. STANDARD FITTINGS CO., 82 HERBERT ST., FRAMINGHAM, MASS.

Aluminum Jacket for Pipe Ells

Aluminum jacket called a "Humped Elbow" protects insulation at pipe ells. Humped feature permits 13 different size jackets to cover 109 combinations of pipe sizes and insulation thicknesses. GENERAL ALUMINUM SUPPLY CO., 1515 EASTERN AVENUE, KANSAS CITY 26, MO.

Plastic Flotation Barrel

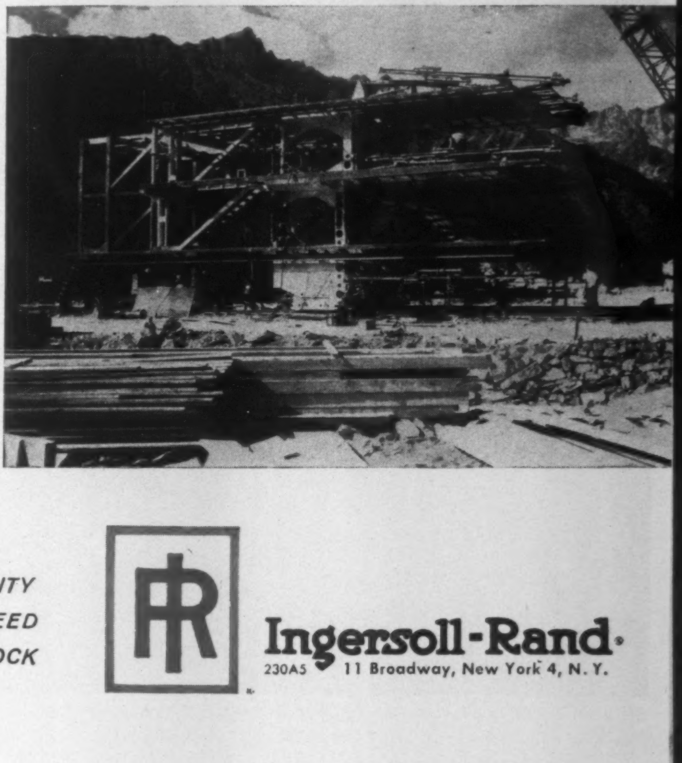
For floating barges, decks and boathouses. Molded polystyrene foam cylinder with galvanized mesh wire. Weighs about 12 lb, will support 480-lb dead weight. CELL-FOAM, INC., FORT WORTH, TEX.



the latest thing in ALPINE JUMBOS

Using one of the largest and most modern boom jumbos ever built, workmen on the French side of the new Mont-Blanc tunnel are waging a winning battle against Europe's highest mountain.

The huge four-level gantry-type jumbo mounts fifteen 3½″ bore Ingersoll-Rand drifters on Ingersoll-Rand Hydra-Booms that provide complete hydraulic positioning for all drills. It was built in Lyon, France, by Ferrand & Frantz, and Entreprises de Travaux Publics Andre Borie. Fourteen-foot blast holes are drilled without steel changes, using 1¾″ Carset bits. A burn hole is put in each round by an Ingersoll-Rand Downhole Drill with an 8″ Carset bit, to permit pulling longer rounds resulting in greater advance per man hour at less cost. Ask your Ingersoll-Rand engineer for complete information.



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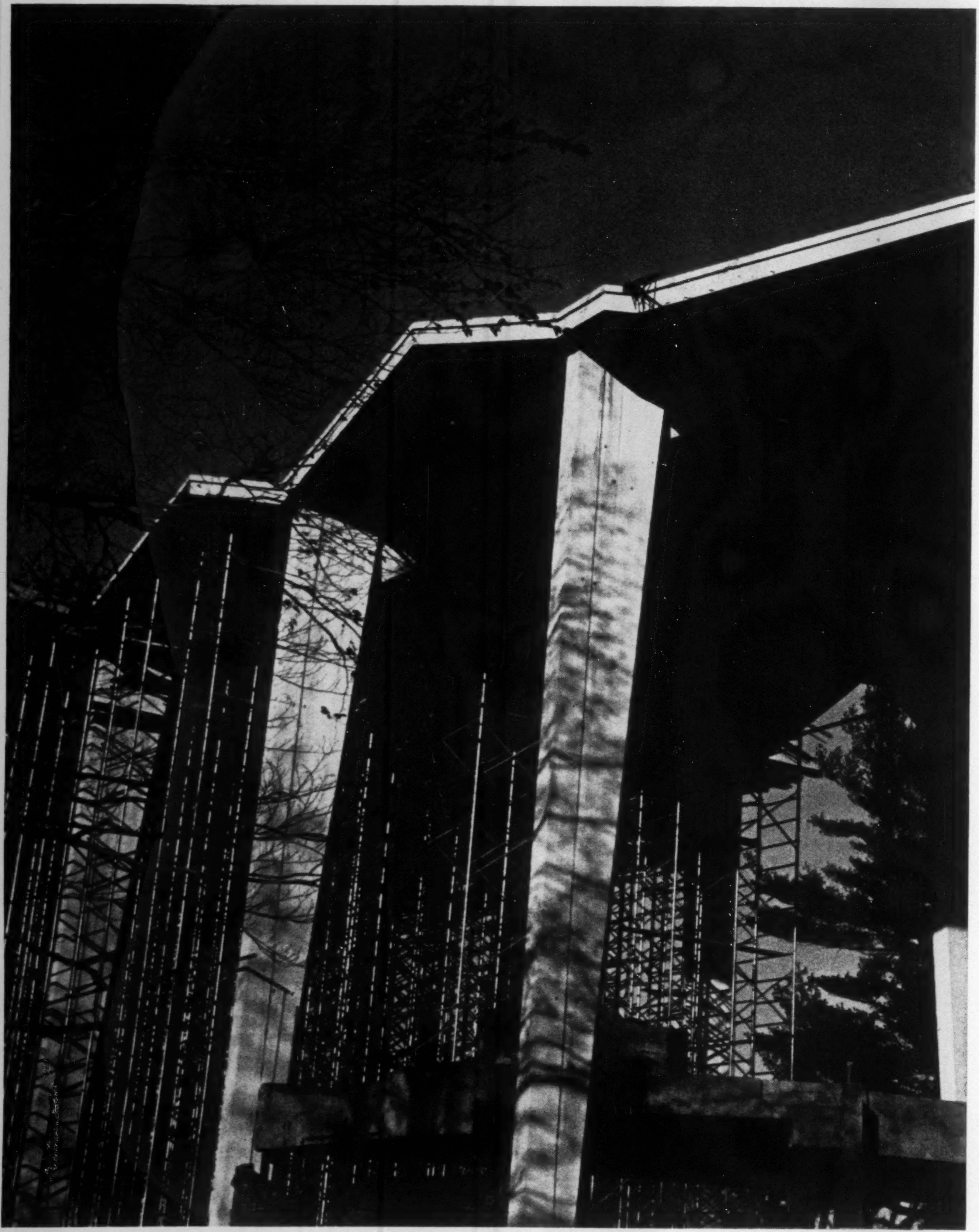

St. Mark's Episcopal Church
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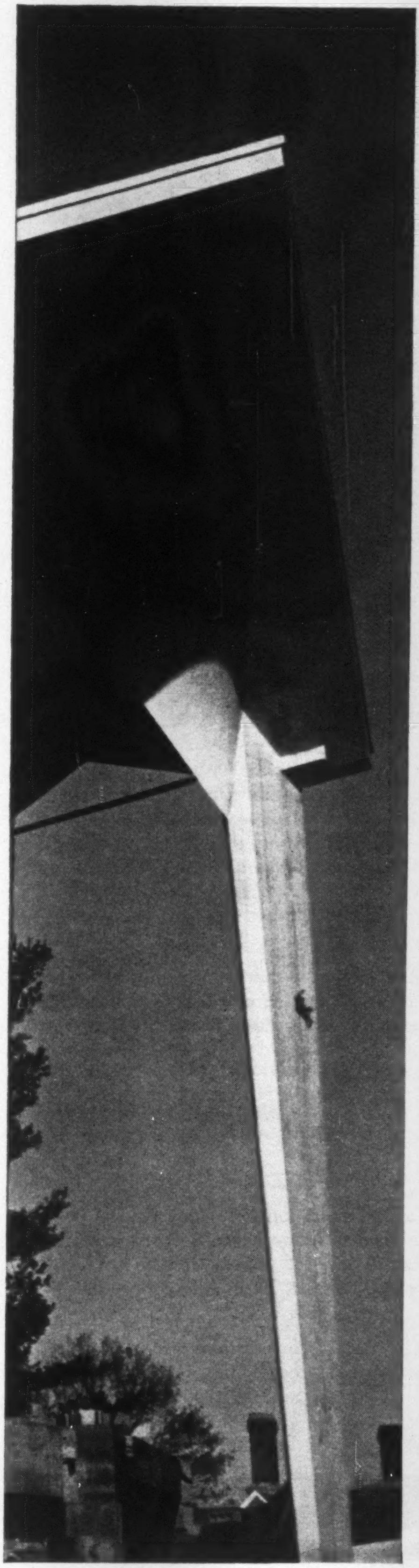
Frank Mercedes & Son, General Contractor
Sherwood, Mills and Smith, Architects



20K heavy duty shoring safely supports huge triangular vault roof

20K FRAMES (each capable of carrying 10,000 lbs. per leg) of "Trouble Saver"® Sectional Steel Shoring are used here to support this complicated 1 ft. to 5 ft.-thick cantilevered concrete roof system of sloping planes and hyperbolic paraboloids. Shoring is quickly erected in free standing, perfectly level and safe units to meet varying heights. Adjustable screw legs are used top and bottom, with U-heads at top to receive stringers. Structure is a 5-bay, 52 ft. by 167 ft. by 50 ft.-high church of modern design.

PS Co. offers complete engineering service through 24 branch offices and warehouses which stock the many types of shoring or scaffolding used when recommending the correct *method* for large jobs or small, complicated or routine. See the Yellow Pages for your nearest source, or write for Shoring Bulletin PSS-51

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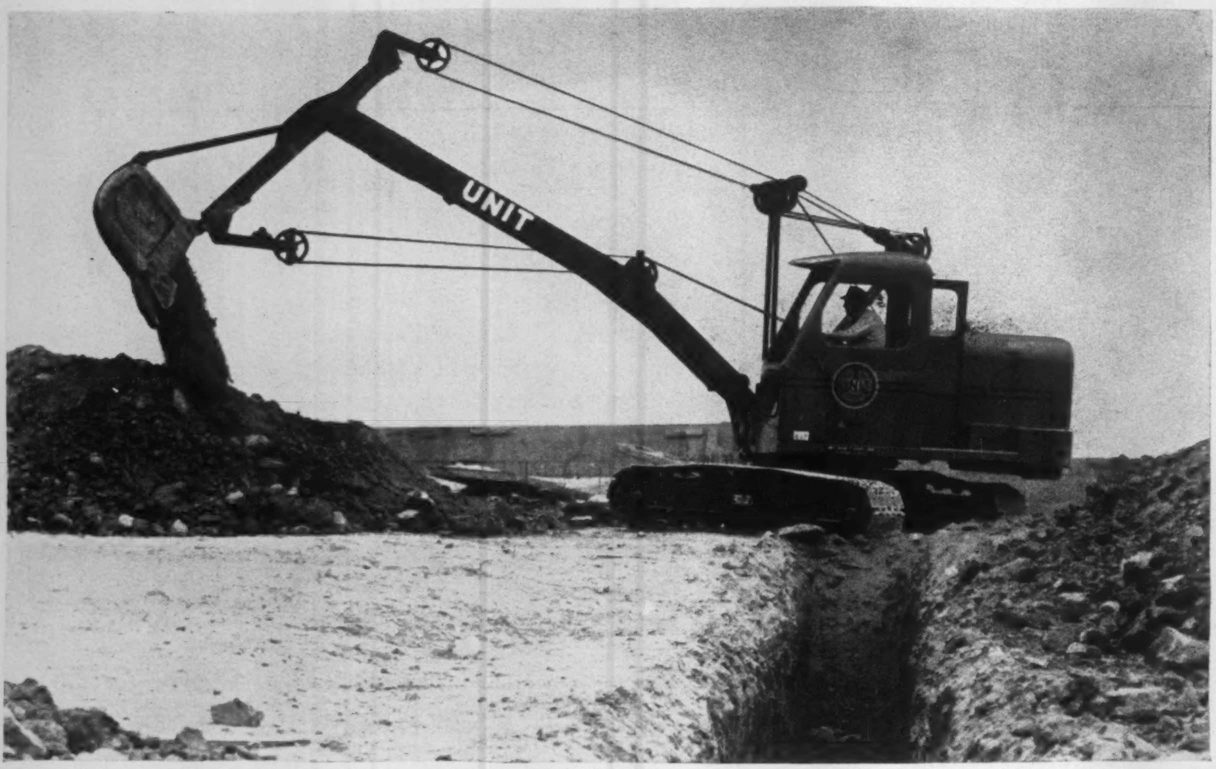

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Books

Analysis of Buckling

THEORY OF ELASTIC STABILITY—SECOND EDITION—by Stephen P. Timoshenko and James M. Gere. 541 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, N. Y. $15.

Extensive rewriting makes the second edition of this famous treatise on elastic stability of even greater value than before. In the process, much new material has been added.

The book continues to emphasize the fundamental theory of buckling of bars, plates and shells. The second edition makes significant changes, though, in the treatment of torsional buckling of columns and lateral buckling of beams to reflect new knowledge of these phenomena. In addition, the discussion of the determination of critical loads of columns by successive approximation has been expanded. Also, several new cases of plate buckling are considered and some tables for calculating critical stresses added.

Stresses in Shells

ELEMENTARY STATICS OF SHELLS—Second Edition, by Alf Pflueger. 122 pp. F. W. Dodge Corp., New York City. $8.75.

A translation of the latest edition from the German, it presents the basic principles of shell theory. The second edition includes material to make it more useful as a reference work for engineers.

Most of the book is devoted to the membrane theory of stress analysis of thin shells. This theory neglects stresses due to bending moments, twisting moments and normal shears. Separate chapters cover shells of revolution, cylindrical shells and general shapes. The last, including hyperbolic-paraboloids, is very short, a meager treatment of an important subject.

A feature of the book is a tabulation of membrane-theory solutions.

Steel Design Textbook

ADVANCED DESIGN IN STRUCTURAL STEEL—By John E. Lothers. 583 pp. Prentice Hall, Inc., Englewood Cliffs, N.Y. $15.

Although written primarily as a textbook, the treatment of structural design in this book makes it suitable as a reference. It is a follow-up to the author's "Design in Structural Steel."

The title implies that the book deals with advanced design. Actually, as the author points out in the preface, it is a treatise on design of statically indeterminate structures. Like a textbook, it presents and explains in simple fashion

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the basic principles of design and gives the solution of numerous problems. To save space, the author gives more emphasis to design than to stress analysis, referring to other sources for added information in a bibliography at the end of each chapter.

The book covers both elastic and plastic design. It shows how to handle multi-story frames as well as single-story rigid frames. It describes design techniques for Lamella (skewed) framing. It takes up continuous and rigid-frame bridges. And it offers a chapter on light-gage structural steel sections.

Plan the Outside, Too

LANDSCAPE ARCHITECTURE—by John Ormsbee Simonds. 244 pages. F. W. Dodge Corp., 119 W 40 St., New York City. $12.75.

Design every structure in relation to its environment is the constantly repeated theme in this reference on landscape and area planning.

Early chapters deal with fundamentals, individual sites and organization of space. Turning toward large-area planning, the last four chapters cover visual considerations, circulation and transportation, structures in space and, finally, regional planning.

Sketches and pictures are sprinkled liberally throughout the book. Wide margins with more sketches, quotations, notes and summaries amplify the text.

Just Published

FLUORESCENT LIGHTING MANUAL—by Charles L. Amick. Third edition. 416 pages. McGraw-Hill Publishing Co., 330 West 42nd St., New York 36, N. Y. $12.50.

DESIGN OF PRESTRESSED CONCRETE BEAMS—by William H. Connolly. 252 pages. F. W. Dodge Corp., 119 West 40th St., New York 18, N. Y. $11.50.

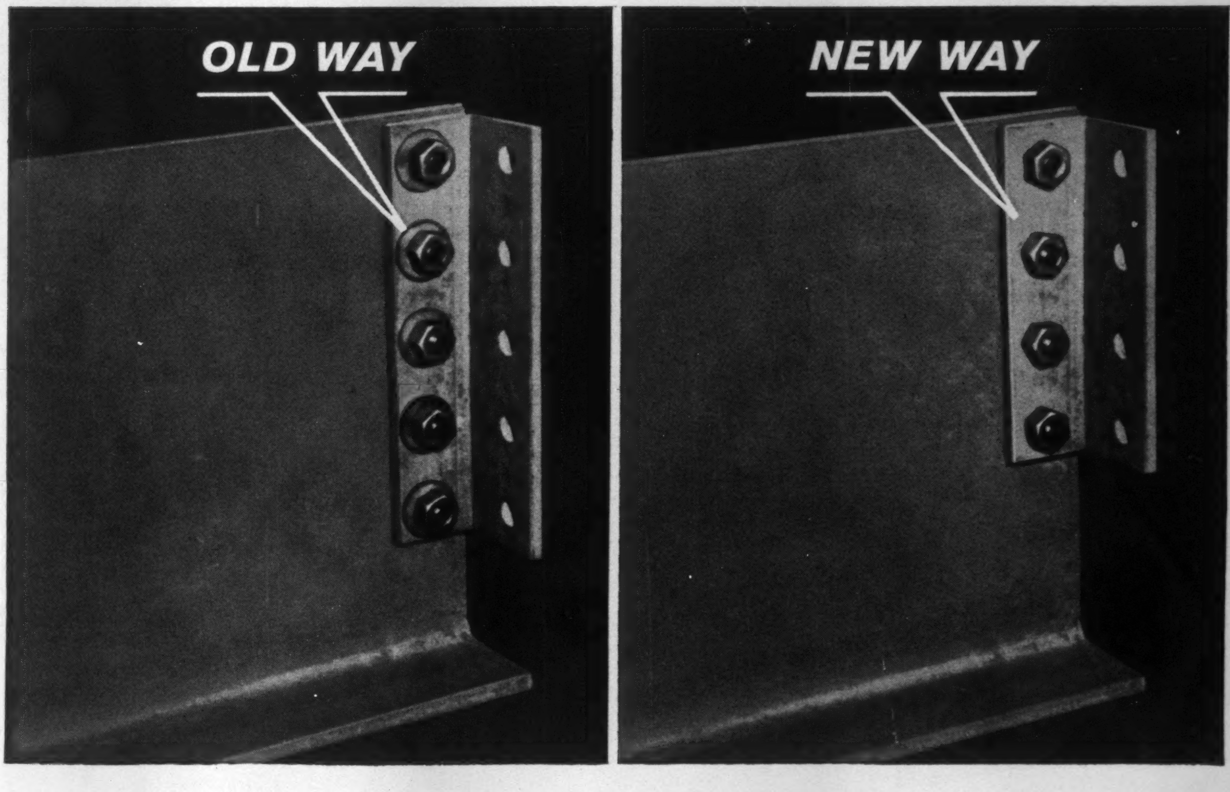
AMERICAN CONCRETE INSTITUTE 55-YEAR INDEX 1905-1959—American Concrete Institute, P. O. Box 4754, Redford Station, Detroit 19, Mich. Members $4.50; nonmembers $9.00.

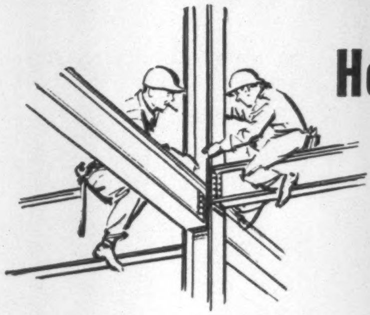
MODERN PHYSICS FOR THE ENGINEER—383 pages. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $9.50.

POWER REACTOR TECHNOLOGY—Atomic Energy Commission. Quarterly. 55 cents per issue, $2 per year. Volume III, No. 4 in this series, soon to be published, will contain a detailed cumulative subject index to all previous issues, dating back to December, 1957.

GEOLOGIC MAP OF THE UNITED STATES—1960 edition. Compiled by G. W. Stose and O. A. Ljungstedt. Four quarters, each 27 x 47 in. U. S. Geological Survey, Washington 25, D. C. $6.00. Latest edition of a map first published in 1933 has been reprinted with color changes that make it easier to read.

(Books continued p. 156)





How R B&W A325 bolts can cut connecting costs 15% on one beam alone

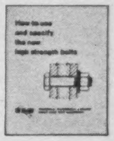
Merely changing the way end clips are bolted to both ends of beam pictured not only can cut connecting costs in the fabricator's shop but also in field erection.

This saving is based on an original cooperative study by RB&W and a large midwestern steel fabricator. As now permitted by the new specification, four new heavy-head, short-thread A325 structural bolts replace five regular high-strength bolts in each end. The result: 12 out of 20 washers and 2 out of 10 bolts disappear from two joints. Operating and material cost drops 15%. Shop productivity increases.

Actually, material savings to *40%* are possible with the new bolt in bearing-type connections. That's because you can use two RB&W heavy-head A325 bolts and two washers instead of three regular high-strength bolts and six washers when there are no threads in the shear planes of the connection.

Cost reductions start with the structural engineer who designs joints. When he applies this approved 2:3 substitution, shop fabricators and field erectors benefit, and can come through with lower bids.

So familiarize yourself with technical-economic advantages of this better connecting method and a digest of the latest Research Council specifications. Write for Bulletin HHS-1. "How To Use and Specify the New High Strength Bolts." Russell, Burdsall & Ward Bolt and Nut Co., Port Chester, N.Y.



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Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Sales office and warehouse at:** San Francisco, Calif. **Sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago. **Sales agents at:** Cleveland; Milwaukee; Denver; Fargo.

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INTERSTATE
SOUTH CAROLINA
26
221
26
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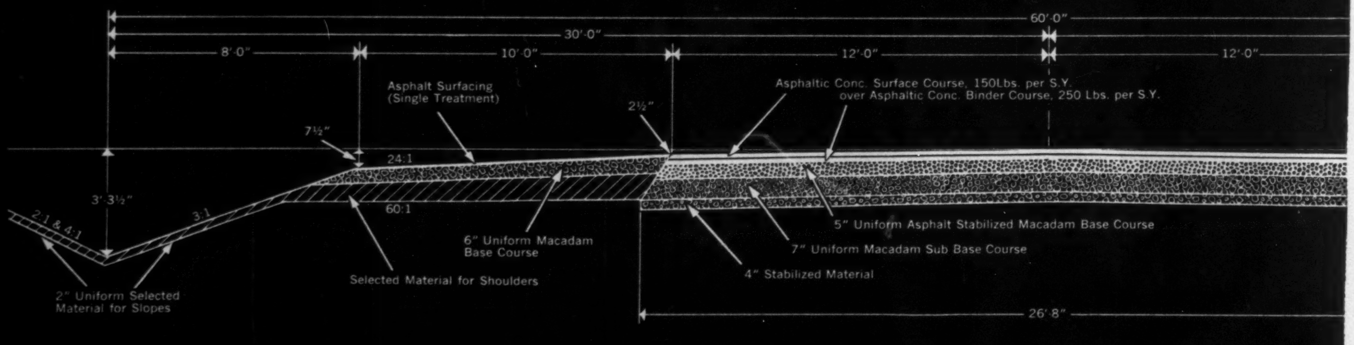
New **DEEP STRENGTH** Asphalt Section of South Carolina Interstate No. 26 extending from Route 296 to U.S. Route 176.

MACADAM SUBBASE course is spread and compacted to 7-inch thickness.


60'-0"
30'-0"
8'-0"
10'-0"
12'-0"
12'-0"
Asphalt Surfacing (Single Treatment)
Asphaltic Conc. Surface Course, 150Lbs. per S.Y. over Asphaltic Conc. Binder Course, 250 Lbs. per S.Y.
7½"
2½"
24:1
3'-3½"
2:1 & 4:1
3:1
60:1
6" Uniform Macadam Base Course
5" Uniform Asphalt Stabilized Macadam Base Course
7" Uniform Macadam Sub Base Course
4" Stabilized Material
Selected Material for Shoulders
2" Uniform Selected Material for Slopes
26'-8"

New Section of South Carolina

Interstate No. 26 uses DEEP STRENGTH Asphalt Constructi

The expanding pattern on the National System of Interstate and Defense Highways is nowhere shown to better advantage than in the State of South Carolina, particularly regarding mileage under contract and mileage constructed. Of the approximate 680 Interstate miles in this state, some 325 miles are under contract. About 180 miles are in the latter stages of construction or open to traffic.

This record is the result of a combination of important factors, among which may be mentioned careful planning, an aggressive and intelligent group of State Highway Engineers, and the adoption of *stage construction* wherever feasible. Last but not least, the use of Asphalt in combination with local aggregates to reduce costs, speed construction, and give the State a highway system which is durable, smoother-riding, and well able to support any traffic loads of the foreseeable future.

An excellent example of South Carolina Interstate Highways is a section of I #26 in the vicinity of Spartanburg. Rainfall and temperatures are normal for the Southern region, and frost conditions are not a serious factor. The design includes a selected top-soil sub-grade, reinforced with crusher-run stone, an Asphalt-primed macadam subbase course, an Asphalt plant-mix macadam base and an Asphalt concrete binder and wearing course.

Asphalt base was a plant-mix macadam with aggregate graded from the No. 4 sieve to 2½ inches, heated and coated with 3% to 4% of 85-100 penetration Asph
laid 5 inches thick in one layer. (Recent contracts spe
a smaller stone constructed in two layers.)

Shoulders follow the general criteria for the Interst
system, with 10-foot surfacing for the outside lane
3-foot for the inside lane. Features that materially
duced shoulder costs were the use of selected mate
for the foundation course with a 6-inch uniform m
adam base and an Asphalt single-surface treatm
with ½-inch stone for cover.

Compaction was performed on the pavement struct
with three wheel steel rollers, high contact press
pneumatic tire rollers and tandem steel wheel rollers.

A study of the section below shows how this DE
STRENGTH Asphalt design assures heavy-duty stren
and durability. This application of DEEP STRENG
Asphalt design principles is the result of many years
study, research, and experience in using local materi
in combination with Asphalt by engineers of So
Carolina's State Highway Department. Their invalua
engineering experience has saved many millions of t
payer-dollars and provided extra mileage of Interst
Highways.

A new edition of the ASPHALT HANDBOOK inc
porates all the Advanced Design Criteria implied in
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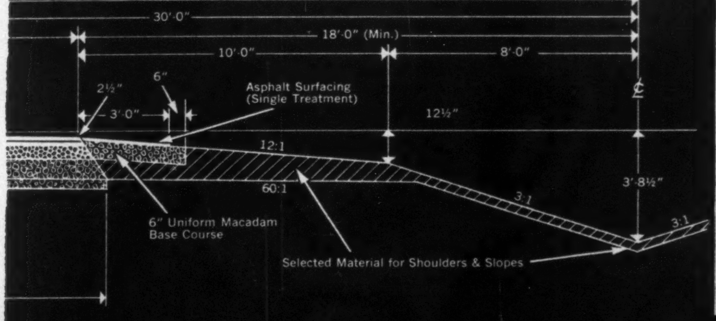
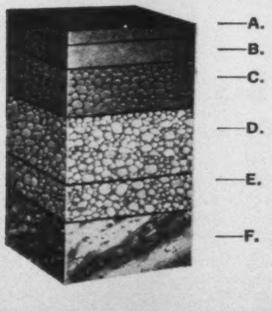
MULTI-LAYER SECTIONS consolidated for smoother riding by high contact pressure pneumatic tire rollers.

36-foot
DEPRESSED
MEDIAN wit
deep longitu
drains assur
good drainag
and lowered
water table.

THE ASPHALT INSTITUTE College Park, Maryland


30'-0"
18'-0" (Min.)
10'-0"
8'-0"
2½"
6"
3'-0"
Asphalt Surfacing (Single Treatment)
12½"
℄
12:1
60:1
3:1
3'-8½"
3:1
6" Uniform Macadam Base Course
Selected Material for Shoulders & Slopes



HERE'S THE DEEP STRENGTH DESIGN OF SOUTH CAROLINA INTERSTATE NO. 26:

A. Asphalt concrete wearing course	1½"
B. Asphalt concrete binder course	2½"
C. Asphalt stabilized macadam	5"
D. Asphalt primed macadam subbase course	7"
E. Stabilized material	4"
F. Subgrade or Improved Subgrade	—
TOTAL THICKNESS	20"

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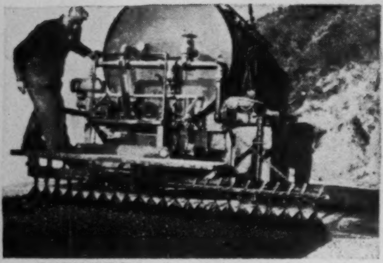

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Metals Handbook—8th edition. 1,300 pages. American Society for Metals, Novelty, Ohio. $30.00.

Measurements for Engineering and Other Surveys—by Michael V. Smirnoff. 556 pages. Prentice-Hall, Inc., Englewood Cliffs, N. J. $9.75.

Advanced Design in Structural Steel—by John E. Lothers. 583 pages. Prentice-Hall, Inc., Englewood Cliffs, N. J. $15.00.

An Introduction to Transportation Engineering—by William W. Hay. 505 pages. John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. $11.75.

Dictionary of Mechanical Engineering—by Alfred Del Vecchio. 346 pages. Philosophical Library, Inc., 15 East 40th St., New York 16, N. Y. $6.00.

Compilation of Chemical Compositions and Rupture Strengths of Super-Strength Alloys—American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $1.50.

Papers on Building Construction—STP 282. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $3.50.

New Approaches to Residential Land Development—Technical Bulletin 40. Urban Land Institute, 1200 18th St., N.W. Washington 6, D.C. $6.00.

Symposium on Technical Developments in the Handling and Utilization of Water and Industrial Waste Water—STP 273. American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. $3.00.

Tables of the Hypergeometric Probability Distribution—by Gerald J. Lieberman and Donald B. Owen. 726 pages. Stanford University Press, Stanford, Calif. $15.00.

Sectional Properties of Corrugated Steel Sheet—American Iron and Steel Institute, 150 East 42nd St., New York 17, N. Y.

Information Requirements for Selection of Plastics for Use in Building—Publication 833. Building Research Institute, 2101 Constitution Ave., N.W., Washington 25, D. C. $3.00.

Adhesives in Building—Publication 830. Building Research Institute, 2101 Constitution Ave., Washington 25, D. C. $5.00.

Concrete Pavement Design for Parking Areas—Portland Cement Association, 33 West Grand Ave., Chicago 10, Ill.

Stream Gauging Manual—by M. G. Hiranandani and S. V. Chitale. 277 pages. Government of India, Central Water and Power Research Station, Poona 3, India.

Mechanical Engineering Experimentation—by George Lewis Tuve. 516 pages. McGraw Hill Book Co. Inc., 330 W. 42nd St., New York, N. Y. $8.00.

Heat Transfer—by Benjamin Gebhart. 454 pages. McGraw-Hill Book Co. Inc., 330 W. 42nd St., New York 36, N. Y.

(*Books continued p. 158*)

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HEAT BIBLIOGRAPHY, 1959—prepared by The Heat Division, National Engineering Laboratory. 404 pages. British Information Services, 45 Rockefeller Plaza, New York 20, N. Y. $3.70

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A GUIDE TO TECHNICAL LITERATURE PRODUCTION—by Emerson Clarke. 200 pages. TW Publishers, Box 152, River Forest, Ill. $3.00

PROCEEDINGS OF THE 1961 HEAT TRANSFER AND FLUID MECHNICS INSTITUTE—edited by R. C. Binder, M. Epstein, R. L. Mannes and H. T. Yang. 236 pages. Stanford University Press, Stanford, Calif. $8.00

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STATUS OF AERIAL PHOTOGRAPHY. (January 1961) Map-index presenting inventory of areas of the United States photographed for Federal, State or commercial agencies. Geological Survey, Washington 25, D. C.

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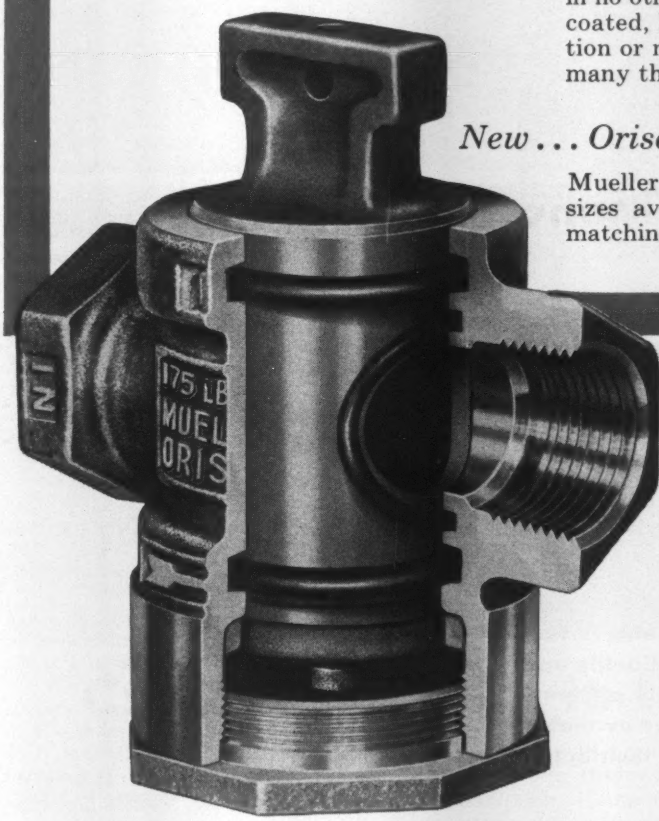

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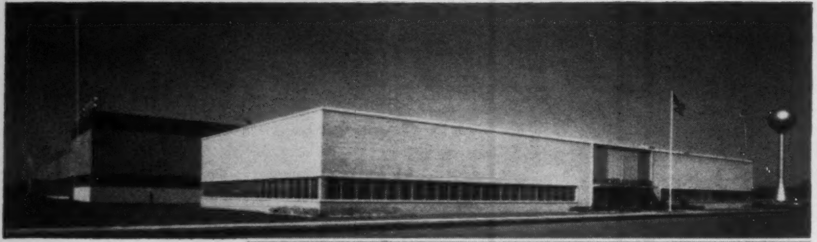

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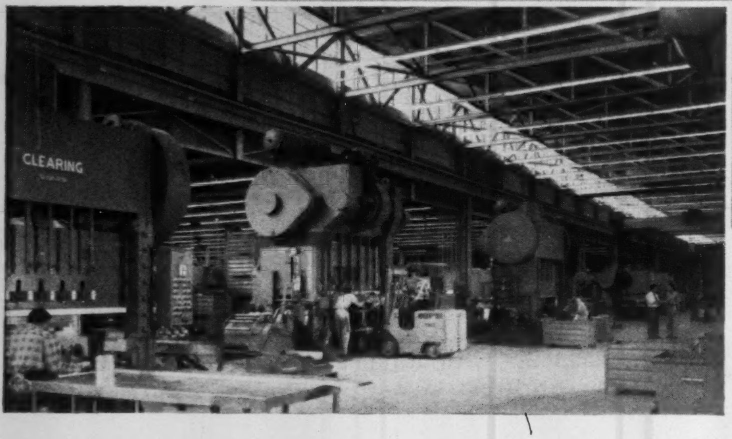

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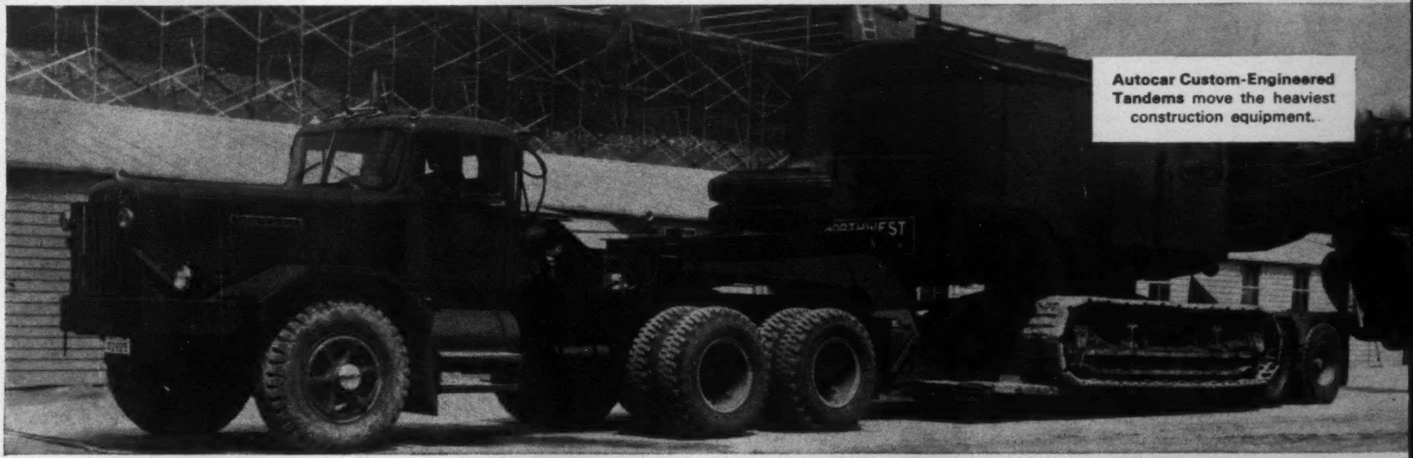

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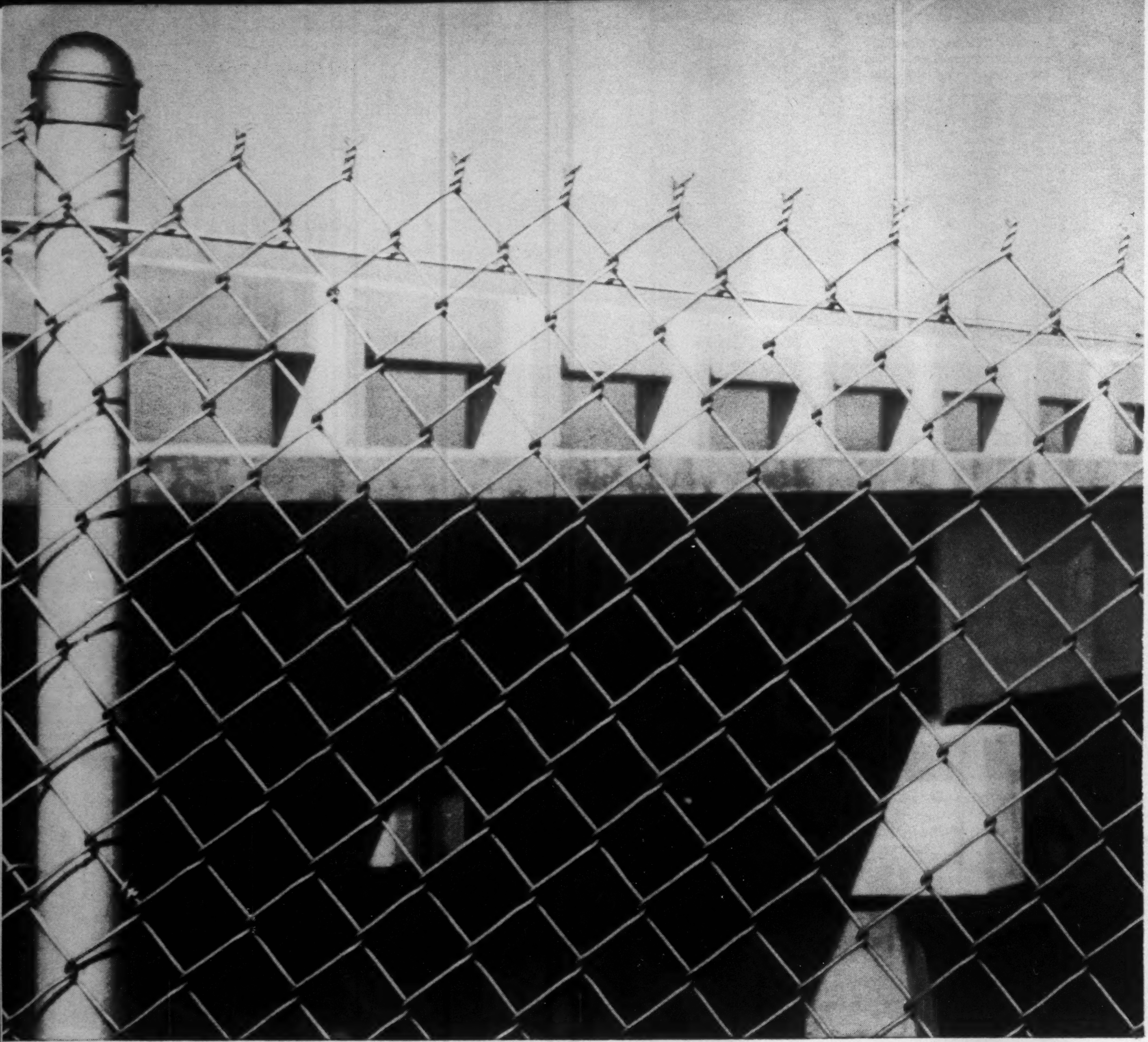

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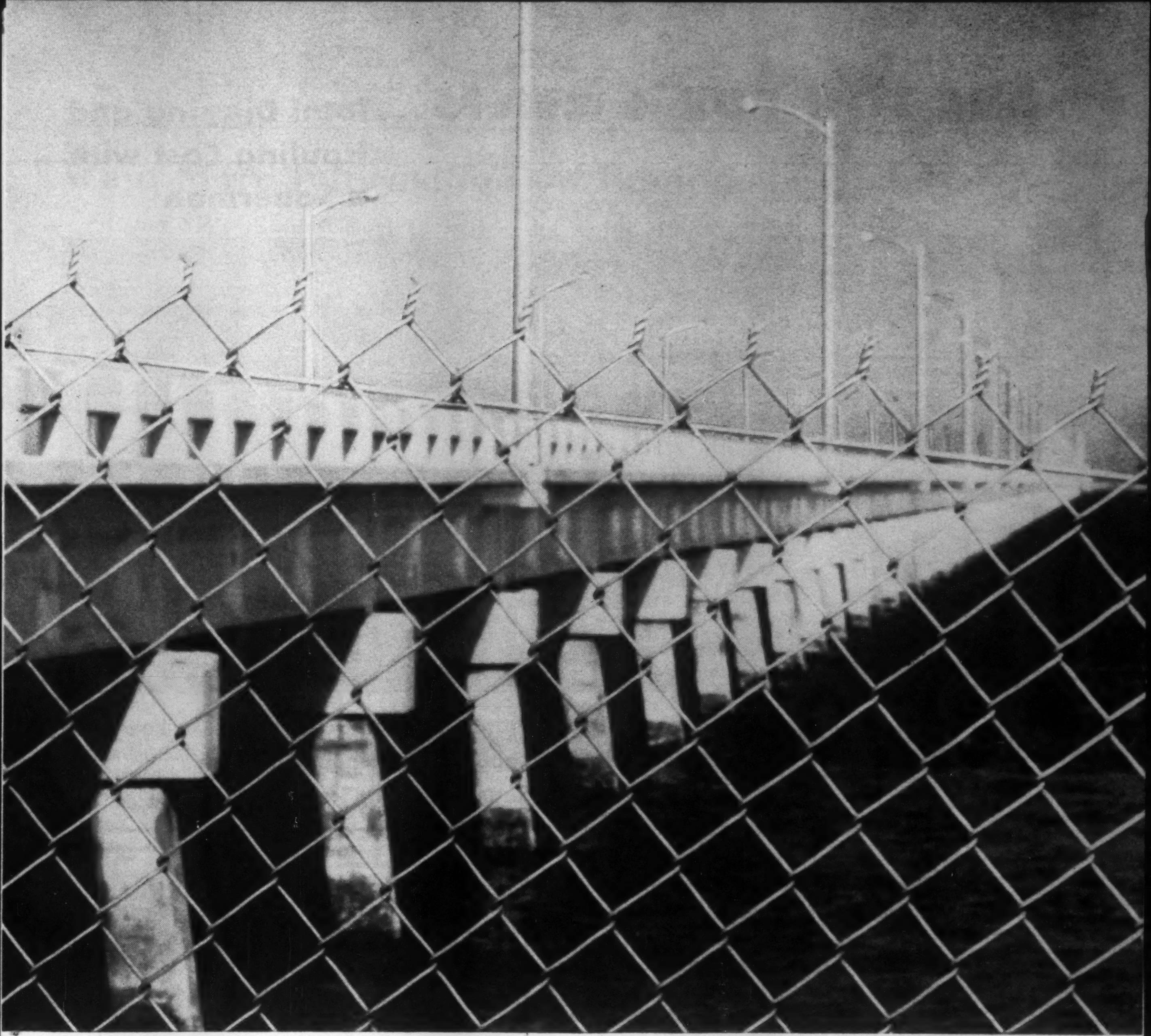

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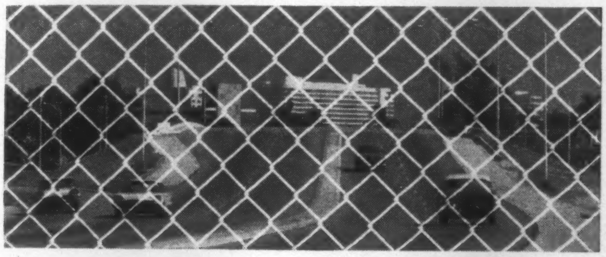

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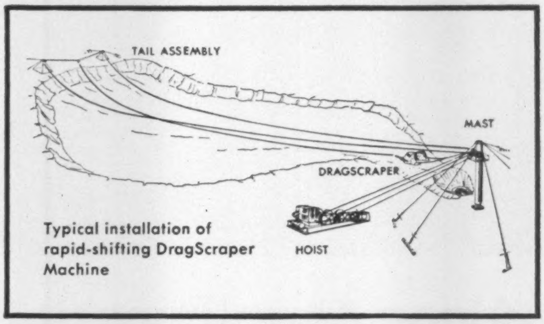

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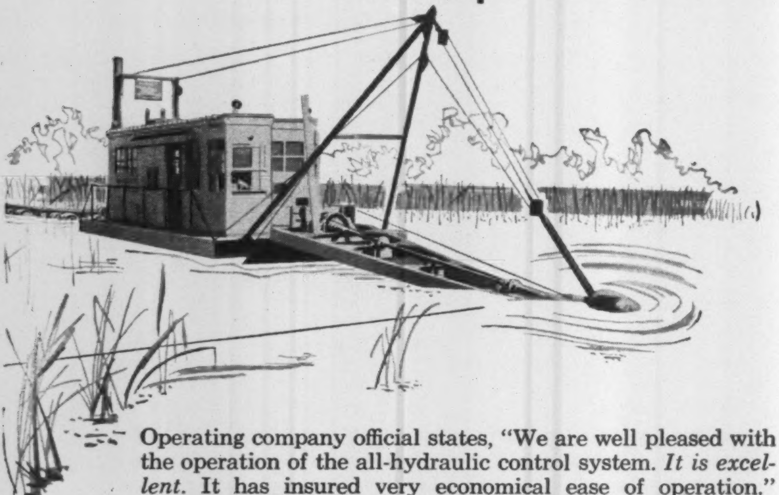

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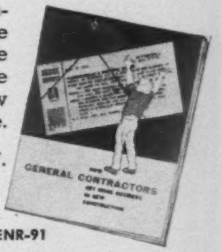

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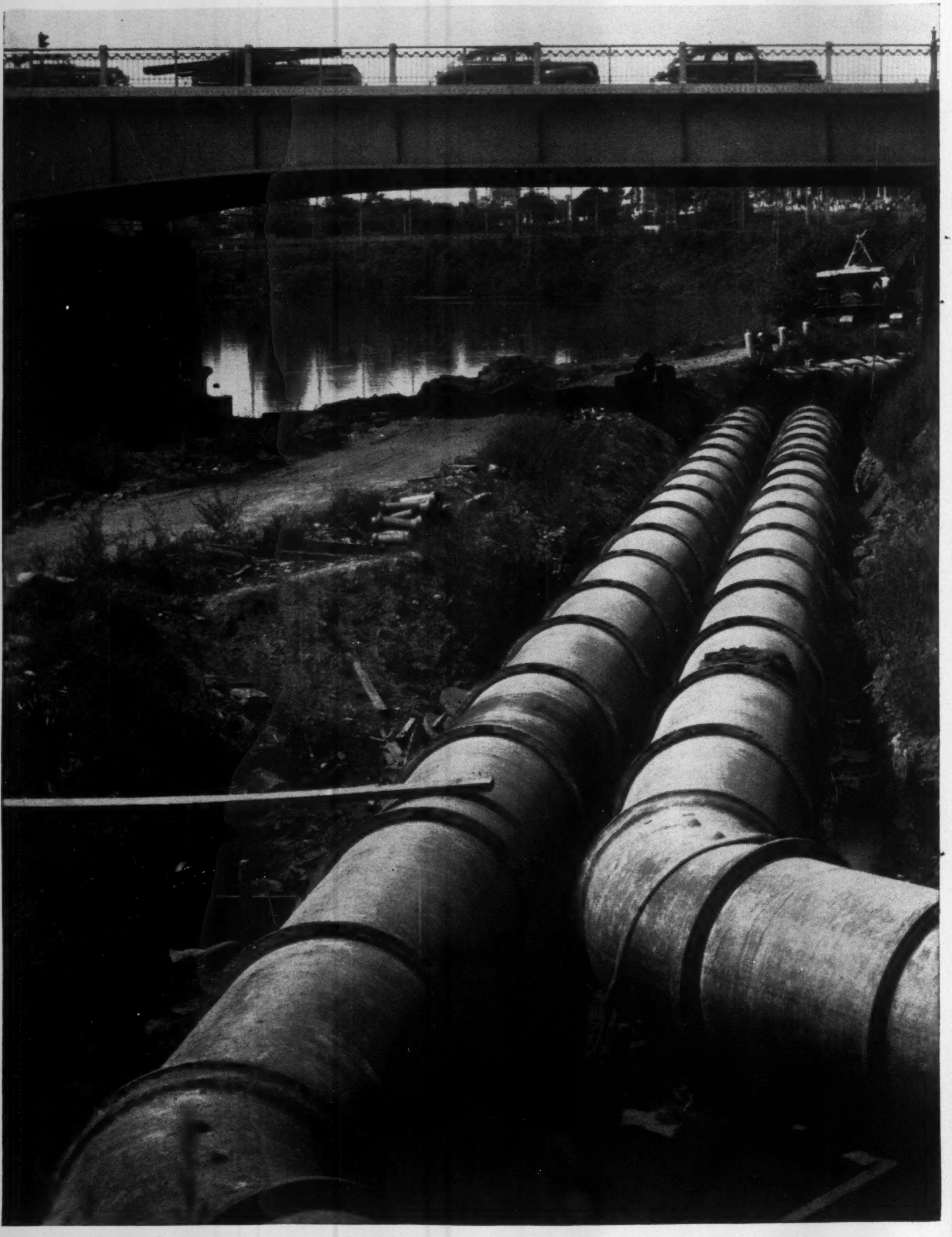

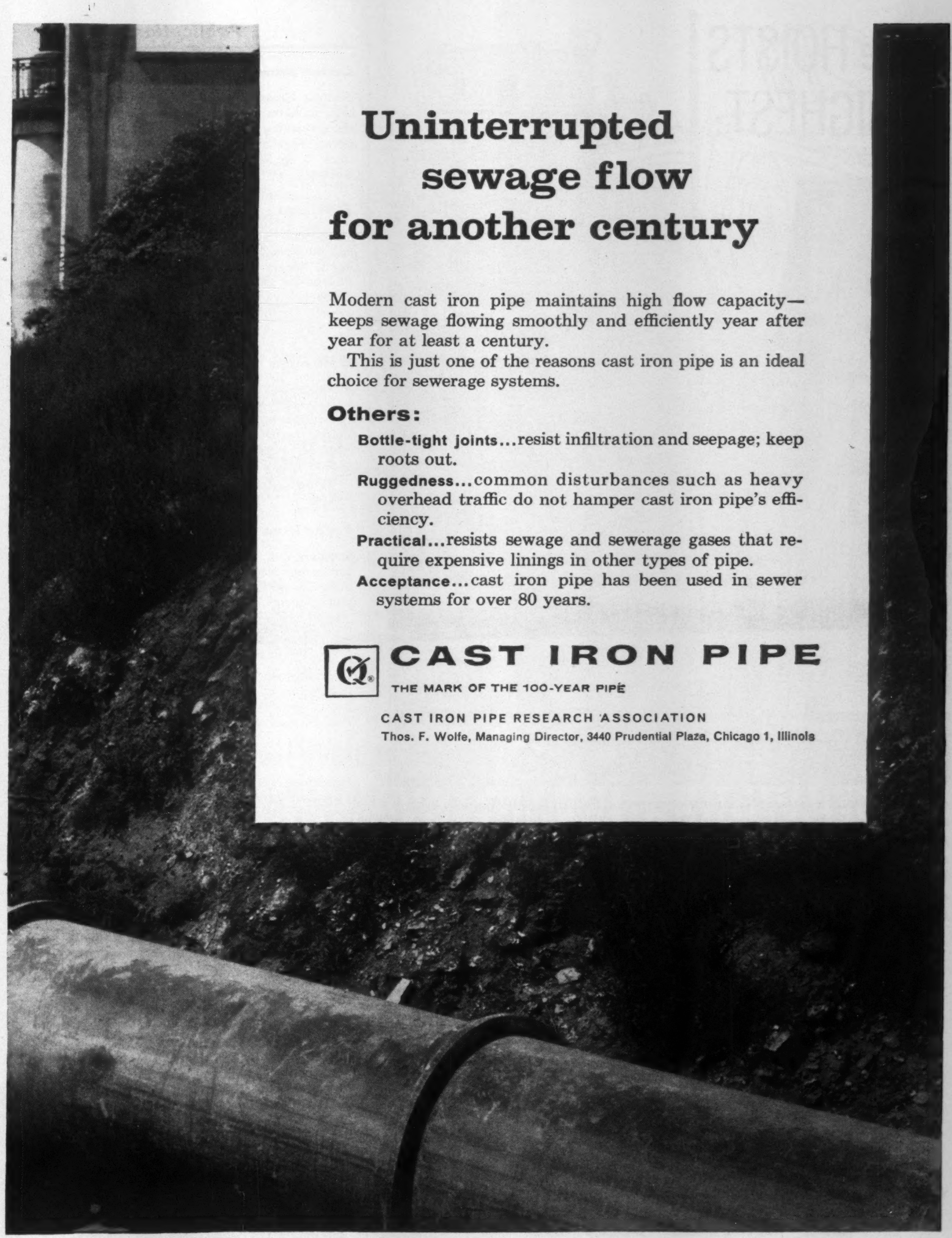

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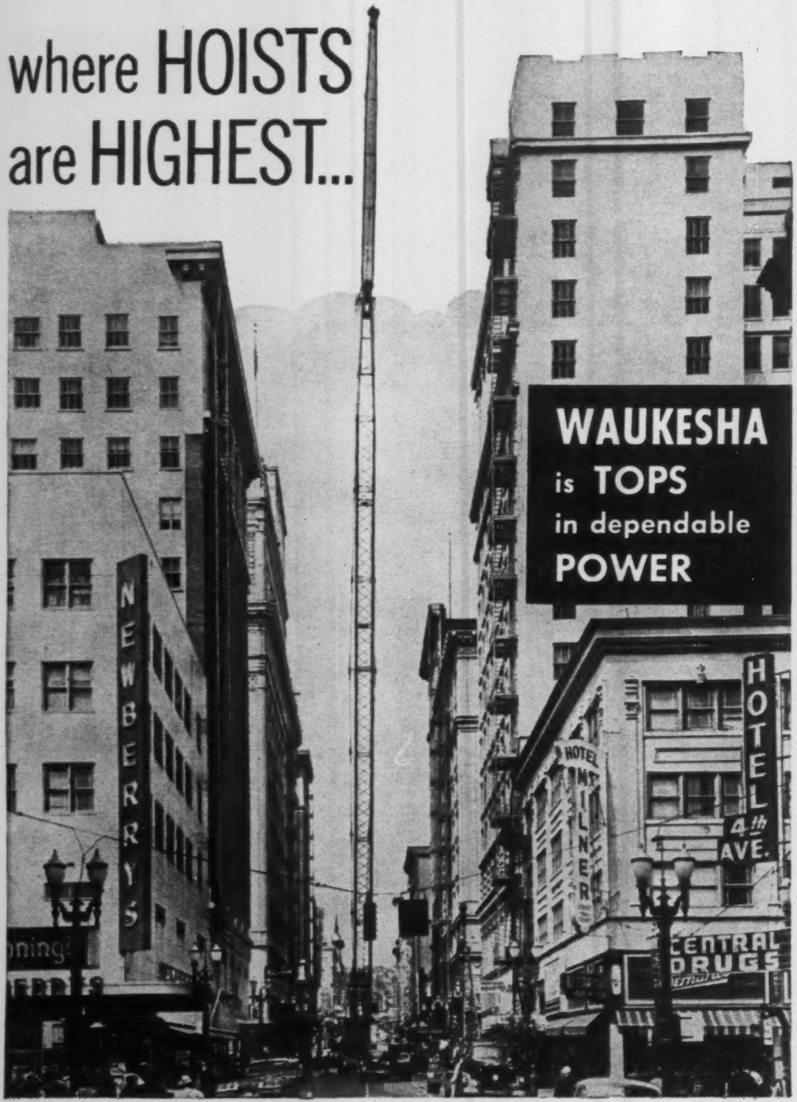

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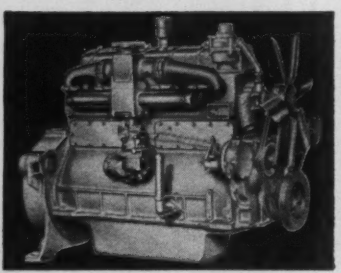
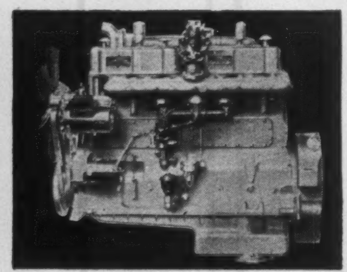
A 15-story hoist! Air conditioning equipment had to go all-the-way-to-top of the Yeon Bldg. in downtown Portland. With a 228-ft. crane boom, reportedly the largest ever used in Oregon . . . a Manitowoc 2900 sixty-ton crane, mounted on a Pierce carrier . . . *and Waukesha Engines* powering both crane boom, and carrier—Don L. Cooney, Inc., Tacoma, experienced operators, and owners of crane, did a smooth, expert job. Long boom jobs take less time, cost less with dependable Waukeshas.

Powering Crane (boom)—135 Series Waukesha Gasoline Engine, six cylinders, developing up to 153 max. hp.

Powering the Carrier—145 Series Waukesha Gasoline Engine, six cylinders, developing up to 263 max. hp.





525

WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN

NEW YORK TULSA HUNTINGTON PARK, CALIF.

Factories — Waukesha, Wisconsin; Clinton, Iowa; Houston, Texas

. . . Publications

Cement placement hose

Maltese Cross, three-ply hose to 2-in. inside diameter for spraying cement. Order sizes, working pressures. Nozzle configurations. Plus air, air drill and water-hose sizes, 2 to 7-ply. Four pages. Hewitt-Robins. 338

Steel forms

For precast and prestressed concrete. Single and multiple T-joists and T-slabs, flat slabs, bents, ledger beams and folded plates. Plus bridge girders, sheet and square piling. Cross sections. 18 pages. Watco Steel Forms Division, Plant City Steel Corp. 339

Wood forms

Modular plywood forms framed with welded steel plus accessories and shores. For continuous walls with standard or odd-shaped corners, curved or battered sides. Also for pilasters, beams, decks, culverts and trenches. Dimensions, applications. 24 pages. Symons Clamp & Manufacturing Co. 340

Paving forms

Standardized, interchangeable steel forms for curbs, gutters and sidewalks. Instructions for setting up, stripping and maintaining forms. Twelve pages. Blaw-Knox. 341

Form clamps and shores

Operating instructions, applications and dimensions of clamps for concrete column forms and for vertical shores. 11 pages. Baker-Roos Inc. 342

Form accessories

Handbook on tying devices, anchorages, accessories and supports for concrete construction. Load charts, roughing-in drawings, section details and specs. Indexed. 118 pages, plus 16 pages on concrete form design. Richmond Screw Anchor Co., Inc. 343

Chains and attachments

Sizes and working loads of high strength chains, cold shuts, grab and clevis hooks and connection links. American Chain and Cable. 344

Tires

A complete line of heavy-duty tires for over-the road and off-the road vehicles and construction equipment. Special purpose tires for sand, soft ground and snow. 16 pages. Continental. 345

For More Information . . .

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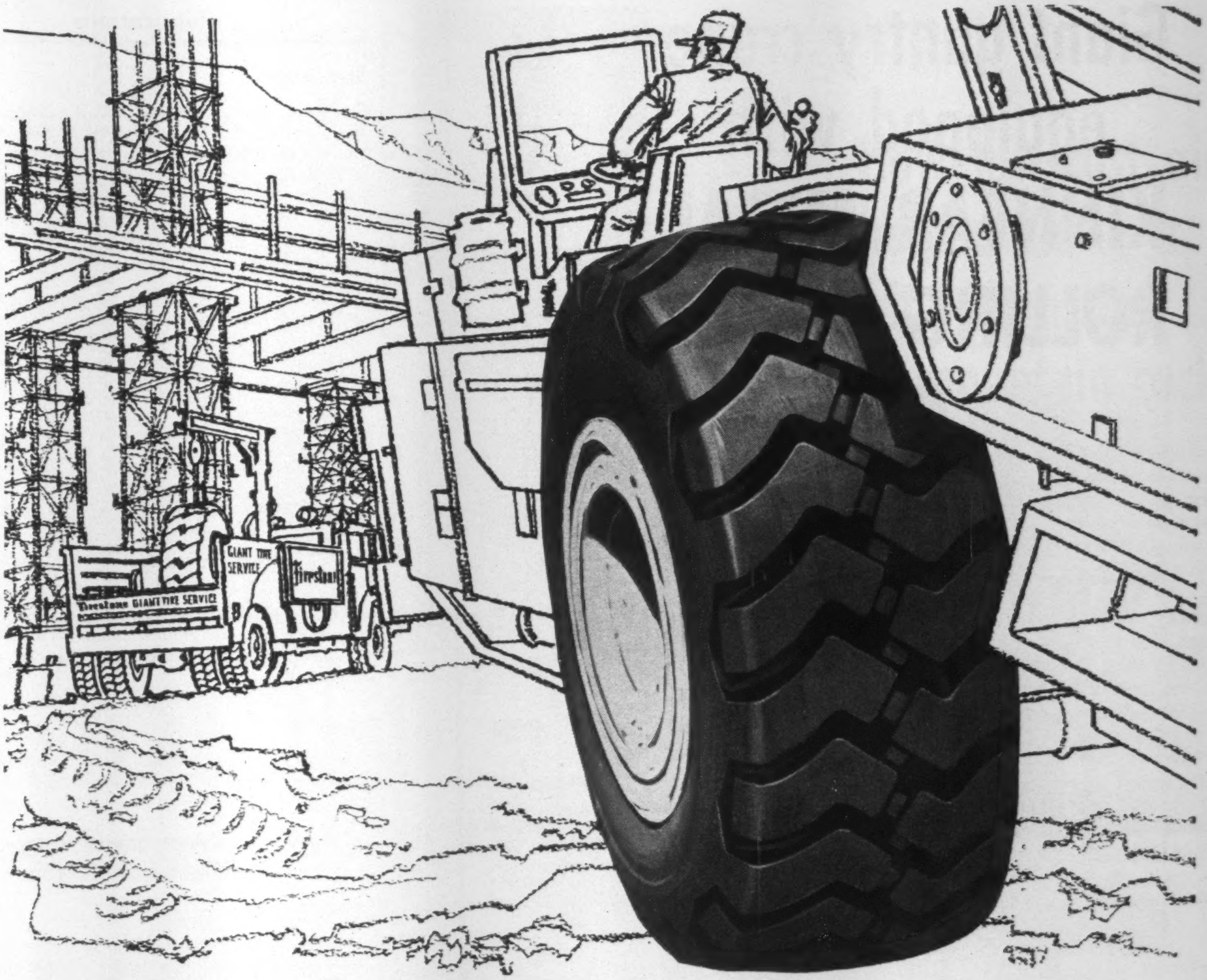

Job records prove Firestone's

OFF-THE-HIGHWAY TEAM CUTS DOWNTIME

1. **Firestone Giant Tires** are ruggedly built to reduce downtime. The SUPER ROCK GRIP (WB) is a good example. With exclusive Firestone Rubber-X and Shock-Fortified cord bodies, this hard-working giant *keeps* your equipment on the move—lets you roll up more yardage with less downtime because it's the toughest off-the-highway tire Firestone has ever built!

2. **Firestone Giant Tire Service** puts a Tire Specialist right on the job to help you eliminate difficulties caused by excessive speeds, heat, cutting, breakage, or *any other* tire problem. In most cases, he's able to spot tire trouble *before* it starts, and save you money by cutting downtime.

Get all the details now on how Firestone's off-the-highway team . . . Giant Tires and Giant Tire Service . . . can add to *your* production and profits. Call your Firestone Dealer or Store, or write: Manager, Off-The-Highway Tires, The Firestone Tire & Rubber Company, Akron, Ohio.

Always Specify Firestone Tires When Ordering New Equipment.

Firestone

FIRST IN OFF-THE-HIGHWAY TIRE NEEDS

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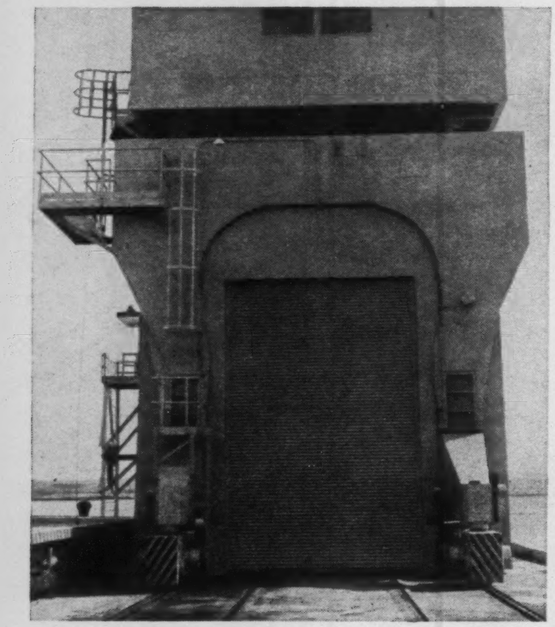
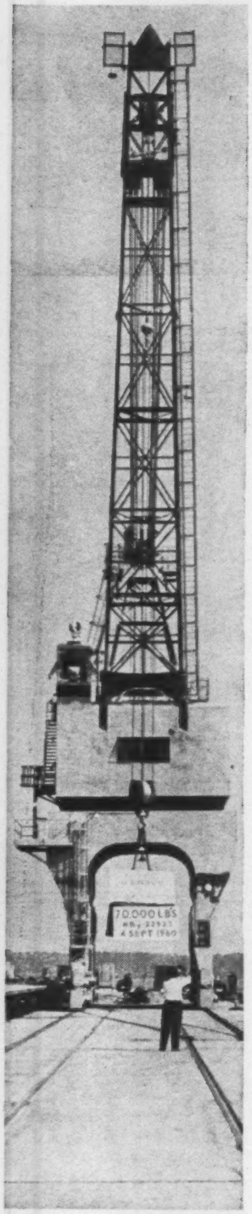
CIRCLE 171 ON READER SERVICE CARD

Giant gantry crane equipped with KINNEAR METAL ROLLING DOORS





Huge Motor Operated Kinnear Doors protect crane's interior from elements

The same space-saving efficiency and ruggedness Kinnear Rolling Doors bring to standard industrial and commercial doorways of every type proves even more important in special applications like this!

These official Navy photographs show a big, high-towered gantry crane* in use at the Polaris Missile Assembly Facility, U. S. Naval Weapons Annex, Charleston, S. Carolina. The large Kinnear Rolling Doors at "fore and aft" of this crane, when closed, fully protect the interior, permitting men to work inside regardless of weather conditions. And open or closed, the doors require no usable "premium" space.

Just one of the many, even more unusual, situations where the proven advantages of Kinnear Rolling Doors can be profitably applied. *We invite you to write for recommendations on your specific requirements.*

**Kinnear recently installed another similar type of installation of doors, 65′ wide x 36′ high—reputed to be the world's largest rolling doors.*

KINNEAR®
ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.
FACTORIES:
1820-40 Fields Avenue, Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Representatives in All Principal Cities

. . . Publications

Stud drivers

Selection data for five powder-charged, Fixrammer stud drivers and more than 65 studs. For driving into steel and concrete. Charges from 25 to 38 caliber. Pull-out load charts to determine stud sizes. Guards, accessories. 12 pages. Sileps, Inc. **346**

Pipe welder

Automatic gas-metal arc welding of mild steel line pipe. How "Aircomatic" process works, equipment required. Four pages. Air Reduction Sales Co. **347**

Power tools

Over 100 power tools for construction, maintenance and automotive service. Model, ratings and attachment sizes. 68 pages. Skil Corp. **348**

Power tools

Ninety-six-page catalog on all types of Delta power tools and accessories including drill presses, belt and disc sanders, band, circular and radial saws, and lathes. Rockwell. **349**

Shop tools

Air and hydraulic presses of up to 100 ton capacity. Eight pages. South Bend Lathe. **350**

Building Materials

Metal buildings

Manufacturer-designed, SF series, one-story storage and office buildings. Clear-span widths to 120 ft, lengths unlimited in 16 and 20-ft bays. Six pages. Parkersburg Rig and Reel Co. **351**

Metal buildings

Suggested applications for pre-fab metal buildings, including warehouses, bowling lanes, shopping centers, club and community centers and auto dealership showrooms. Stran-Steel Corp. **352**

Storage tanks

Large prestressed wire-wound storage tanks in several applications. Specifications, capacities and dimensions. 16 pages. Crom Corp. **353**

Prestressed roofs

Construction of roof decks with prestressed concrete T framing. Thermal values, noise reduction coefficients, and fire ratings with metal, fiber and poured gypsum decks. Six pages. Lin Tee Affiliates. **354**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.

DOWN THIS CRAGGY 45% SLOPE goes the 1400′ long, 13′ diameter steel and cement penstock for the new Camino Powerhouse. The first phase of the job, a part of the Upper American River Project near Sacramento, California, was handled by Western Knapp Engineering Company and included the powerhouse excavation and the penstock "slot," anchors and immediate supports.

How low-cost air helped carve a 1400′ penstock in mountain rock

On this cliff-hanging drilling operation, a battery of Jaeger Roto Air Plus Compressors (900, 600 and 125 sizes) provided all the air power the contractor needed, and saved money every hour they worked.

THE JAEGER "900" AND TWO "600s" delivered full rated capacity at a fuel- and engine-saving 1700 rpm. That's 100 rpm (48,000 revolutions per 8-hour day) slower than competitive compressors that use the exact same GM 6-110 and 6-71 diesels. Naturally, diesel fuel goes further in a Jaeger (the compressors averaged over 500 cu. ft. per pound of fuel) and the engine lasts longer. It works less. For the same reason, compressor life is longer — up to 10,000 hours without a vane replacement is not unusual.

THE BATTERY OF JAEGER "125s" powered heavy 55 lb. sinkers with comparable efficiency, also producing more than 500 cu. ft. of air per pound of fuel at an easy 1750 rpm.

Full air pressure at slow engine speeds is one of the quality-plus characteristics of Jaeger rotaries — 75 to 900 cfm. Ask your Jaeger distributor for all the facts and figures, or write for our new compressor catalog.

JAEGER
ROTO AIR PLUS

A "MOUNTAIN" OF AIR POWER, TOO: In addition to the Jaeger 900 and 600 Roto Air Plus Compressors shown here, another 600 on top of the slope plus several Jaeger 125s were used for hand drilling. The "900" powered two Thor TR-5 Trac Drills.

The JAEGER MACHINE CO., 200 Dublin Avenue, Columbus 16, Ohio
Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario
Worldwide sales and service through Jaeger International Corp., Apartado 137, Panama, R. P.
PUMPS • TRUCK MIXERS • CONCRETE MIXERS • CONCRETE SPREADERS • FINISHERS • FINISHER-FLOATS

CIRCLE 173 ON READER SERVICE CARD

CIRCLE 174 ON READER SERVICE CARD →

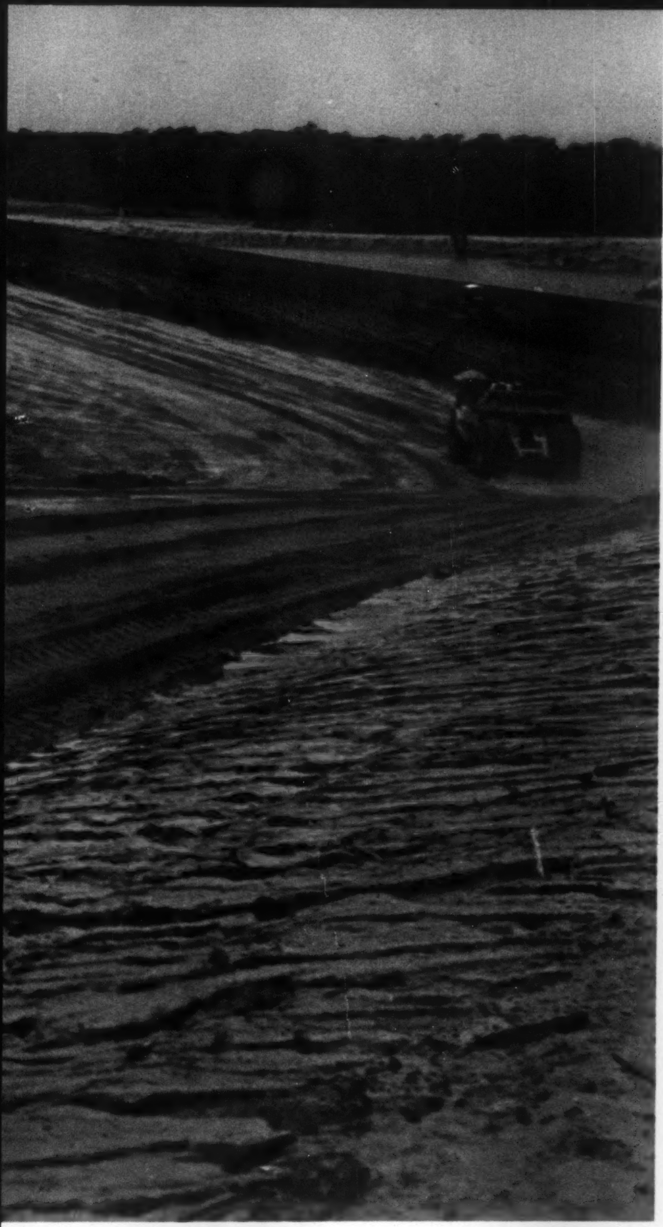
Contractor on $60 million dam improves with just three Gulf lubes . . .

When McGee Bend Dam, Jasper, Texas, is completed, it will form the largest lake in the state (114,500 acres, 560 miles of shoreline). The mammoth earthen dam will be 19,430 feet long and rise 120 feet above the Angelina River.

Cosmo Construction Company, Houston, Texas, has already completed river diversion work and is now working on a part of the dam itself. The former required removal of 330,640 yards of unclassified material. The latter calls for moving 1,600,000 yards of selected fill.

The simplified lubrication program developed for all equipment on this project requires only three Gulf lubricants, plus a hydraulic oil. Adoption of this program has resulted in lower lubricant handling costs, elimination of application errors, and improved maintenance.

Gulf Super-Duty Motor Oil is used as crankcase oil for all equipment. Mr. Charles Kirl, Project Superintendent, tells why, "We've been inside a couple of engines to check on their condition and were pleased to see how clean they were." The other



Fuel and lube storage is located near access road that runs between borrow pit and dump area.

Left to right: T. H. Chambers, Gulf Representative; Charles Kirl, Project Superintendent, and Ray Baldwin, Gulf Distributor, discuss results of simplified lubrication of equipment used in project.

◀ Two scrapers climb access road on way to borrow pit. The dam will stretch better than 19,000 feet across this valley.

maintenance

GULF MAKES THINGS RUN BETTER!

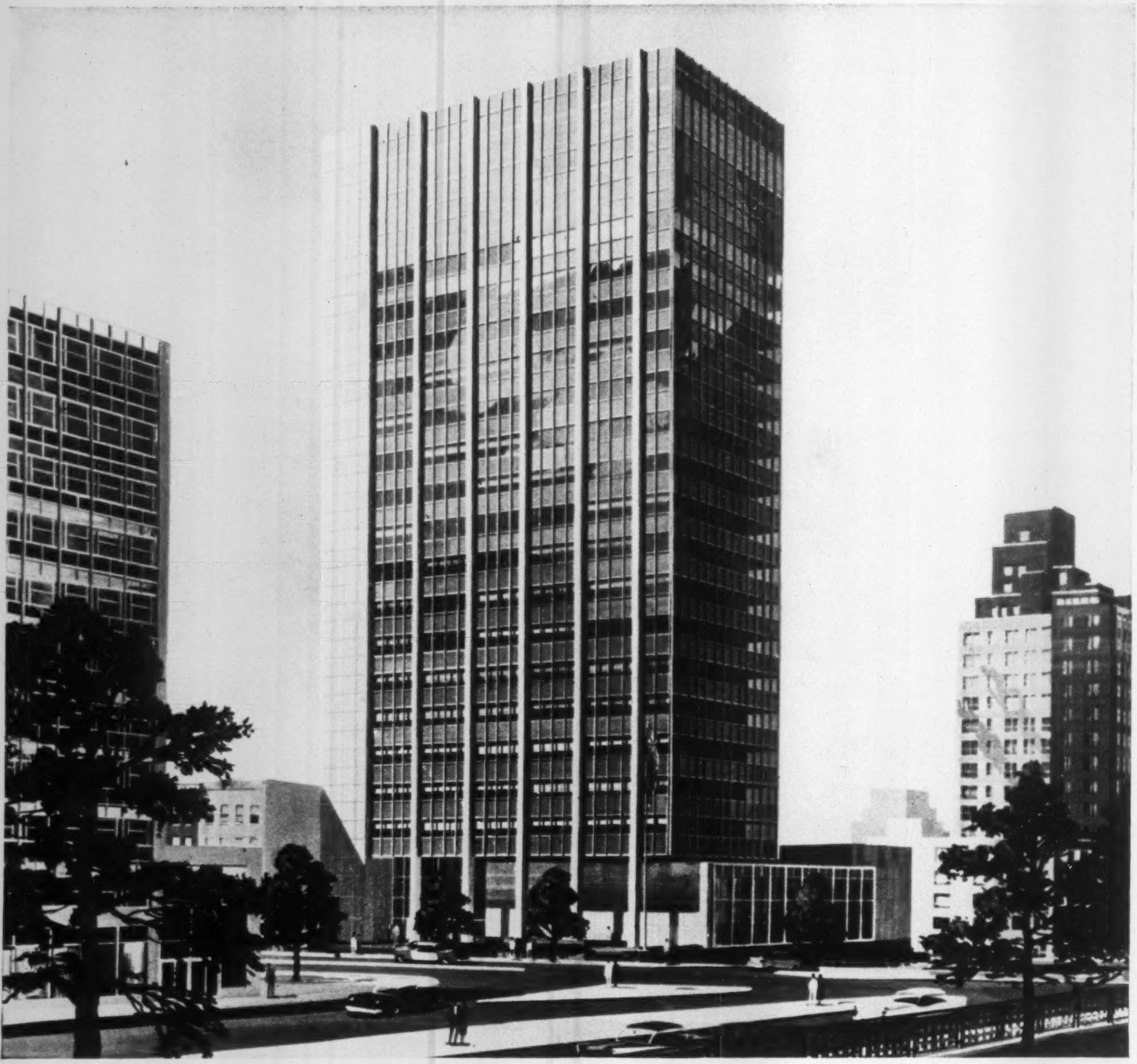
Gulf lubricants are: Gulflex® A for wheel-bearings; Gulf Multi-Purpose Gear Lubricant for transmissions, differentials and power takeoffs. Gulflube® Motor Oil H.D. is used for hydraulic systems.

Cosmo uses clean-burning Gulf diesel fuel for maximum power and long engine life. This high quality fuel also helps to keep filters, tanks and injectors free from harmful deposits.

Gulf products can help you get the most from your equipment with lower maintenance costs. May we have the opportunity to prove it on your next project? Just contact your nearest Gulf office for a quotation. For helpful maintenance tips, and information on Gulf products write for a copy of the "Contractors' Guide."

GULF OIL CORPORATION
Dept. DM, Gulf Building
Houston 2, Texas

SP 10145



LIFETIME GOOD LOOKS — Scheduled for completion by mid-1961, New York's United Engineering Center will provide 260,000 square feet gross area for 18 engineering bodies. Exterior of Nickel Stainless Steel and glass will always be easy to maintain. Architects: Shreve, Lamb & Harmon Associates. General Contractor: Turner Construction Company. Nickel Stainless Steel fabricator: Moynahan Bronze Company.

Why engineers choose Nickel Stainless Steel for their own United Engineering Center

Engineers and architects know how well Nickel Stainless resists pitting and corrosion . . . how its high strength-to-weight ratio allows reduction of gauge thickness—without loss of strength—to make it competitive in cost with less durable architectural metals.

They know, too, that because it is solid metal—corrosion-resisting all the way through—Nickel Stainless holds its beauty even in industrial atmospheres. Its surface stays so smooth that rainfall alone helps keep it clean.

These reasons explain why window frames, louvers, mullions and column covers will be made of Type 302 Nickel Stainless. And they also explain why Nickel Stainless was chosen in combination with masonry and glass to achieve striking effects for lobby and entrances.

Now is the time to include Nickel Stainless Steel in *your* plans. Inco will be glad to assist you in every possible way. As a starter, send for the booklet, "Architectural Uses of the Stainless Steels." It's free on request, and will make a valuable addition to your reference files.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO

Inco Nickel

Nickel makes stainless steel perform better longer

CIRCLE 176 ON READER SERVICE CARD

Roof trusses

TECO plate-type roof trusses, with prepunched joining plates. For spans to 32 ft and slopes to 7 in 12. Structural plans, with design loading and lumber recommendations. Hardware schedule and assembly benches. 16 pages. Timber Engineering Co. **355**

Wood trusses

Roof trusses, designed by manufacturer. Solid webs, laminated chords. Truss spans to 137 ft, joist spans to 24 ft. Bearing details, specs. Four pages. Unit Structures, Inc. **356**

Gypsum roof decks

Design data for poured gypsum roof decks. Working stresses, modules of elasticity and allowable shear on anchor bolts and dowels. Four pages. Gypsum Association. **357**

Cellular concrete slabs

Precast deck slabs with hollow cores that serve as electrical raceways. Detail drawings of joints, tie-ins with bearing and nonbearing members and couplings with conduit inside partitions. Also installation of fixtures and junction boxes. 14 pages. The Flexicore Co., Inc. **358**

Roofing accessories

Product data sheet on membrane fabric, cant strips, roofing mops. Also asphalt accessories, including roof coat, primer plastic cement and roofing cement. Owens Corning Fiberglas Corp. **359**

Structural steels

"New Concepts in Steel Design and Engineering." Four papers: (1) fourth dimension in design, economics; (2) lighter weight and lower cost with stronger steels; focus on hybrid beam that combines high and low-strength steels; (3) column strength, as result of manufacturing process; (4) new steels. 59 pages. United States Steel Corp. **360**

Low-alloy steel

Physical properties, weldability and formability of columbium-alloy bearing, shaped and sheet steels. Four strength levels; up highest minimum yield point is 60,000 psi. Jones and Laughlin Steel Corp. **361**

Hardened steel

Comparative properties, time corrosion graphs and specifications for high-strength, low-alloy steels. Six pages. Jones & Laughlin. **362**

For More Information . . .

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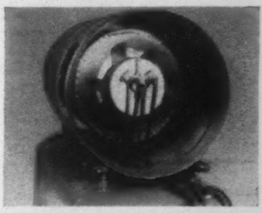
NOWHERE CAN YOU BUY SO MUCH PORTABLE HEAT FOR SO LITTLE!

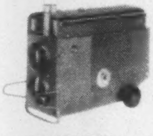
NEW! HERMAN NELSON HEAT GENERATORS

Hurry up heat when you want it—volume air circulation • Engineered for safe, quiet operation • Automatic ignition, automatic temperature control • 16 hours continuous operation • Burn kerosene, #1 or #2 fuel oil • Stainless steel combustion chamber • Controls and handle on cool end of machine • Complete combustion—no fumes, smoke or open flame • Use wherever you need quick, safe portable heat. A DEMONSTRATION WILL CONVINCE YOU!

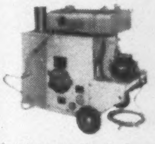


Unique swirl combustor—maximum fuel economy.

America's most complete line

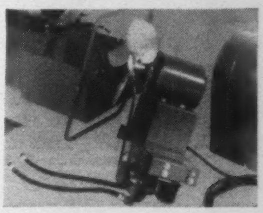


DE LUXE Fully automatic; the finest air heater-blower you can own. Up to 450,000 BTU.



UTILITY Interchangeable gasoline engine or electric motor. Up to 425,000 BTU.

HN 850
125,000 BTU
HN 2250
300,000 BTU



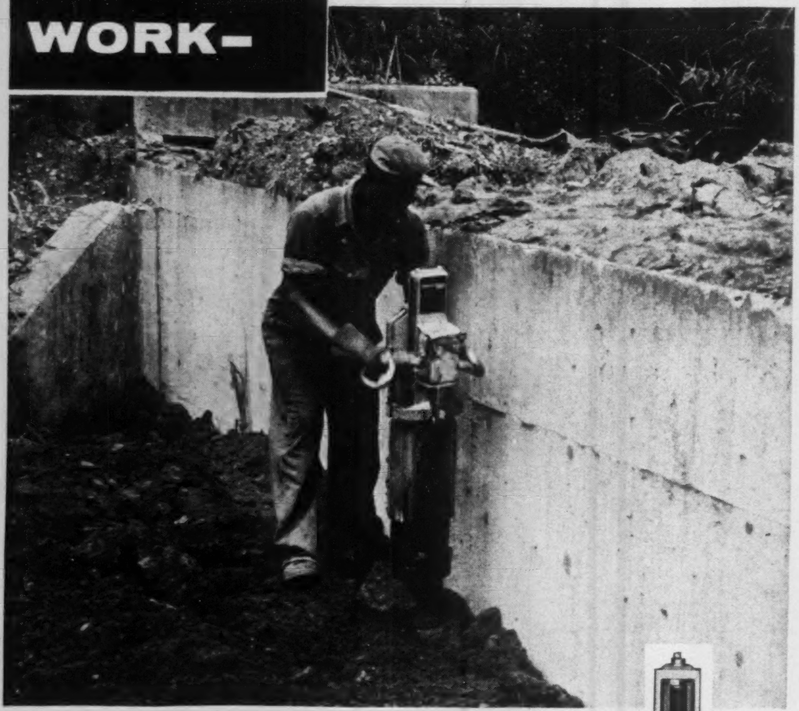
Removable power pack for easy servicing.

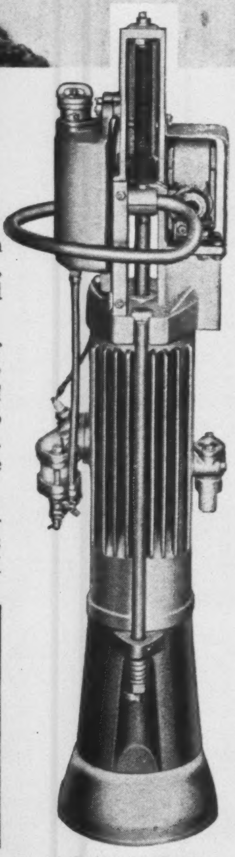
AAF
herman nelson

FREE: SEND FOR INFORMATION ON COMPLETE LINE AND OPERATING TIPS.
American Air Filter Co., Inc.
Portable Products Dept. ENR-1, Louisville 8, Ky.
NAME____________________
COMPANY____________________
ADDRESS____________________
CITY__________ZONE____STATE________

CIRCLE 177 ON READER SERVICE CARD

ON ROAD WORK–



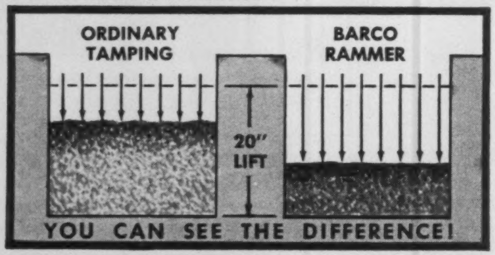


Barco Rammers are Essential

CHECK THE RECORDS for *soil compaction* on every top ranking highway, toll road, thruway, or freeway built in recent years and you will find Barco Rammers!

Easily meet rigid specifications—In test after test, Barco Rammers have delivered 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful in restricted areas. ONLY Barco can produce specified high degree compaction on lifts up to 20 inches.

Get jobs finished on time—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. ASK FOR A DEMONSTRATION.



FOUNDED 1908
BARCO
PRODUCTS BACKED BY EXPERIENCE

BARCO MANUFACTURING CO.
514-K Hough Street • Barrington, Illinois

Sold and Serviced by Nation's Leading Distributors

Steel grating

Bearing bars spaced 1 3/16 c-c, twisted cross bars welded 4 in. c-c. Over-all panel widths to 23⅞ in. Tables for safe load, weight of grating per sq ft and clip selection for attachment to steel members. 12 pages. Kerrigan Iron Works Co. **363**

Concrete and mortar

Applications of nonshrink mortar, four pages. How to repair concrete floors with premixed mortar, two pages. Factors affecting quality of concrete and mortar installations, four pages. The Master Builders Co. **364**

Lightweight aggregate

Physical properties, concrete-mix proportions and insulating values. Deck designs and load-test charts. Also U values for granular-fill insulation. Specs. Four pages. Perlite Institute, Inc. **365**

Chemical-resistant cement

Test data for furan, phenolic, sulfur, silicate and asphaltic cements, under 75 different corrodents at 75 F and 140 F. Five pages. Acid-Proof Cement Manufacturers Association. **366**

Protective coatings

Tar-saturated fabric; pitch, creosote and asphalt coatings for dampproofing and waterproofing above and below grade. Protects metal fences, masonry walls, concrete and wood floors. Eight pages. Barrett Div., Allied Chemical Corp. **367**

Masonry wall waterproofing

Ten coatings—bituminous, asphalt, mastic and semi-mastic—for dampproofing masonry and concrete walls. Interior, exterior, above and below grade application. Four pages. A. C. Horn Companies. **368**

Pozzolith

Advantages of using Pozzolith in bridge concrete cast under a variety of conditions. 16 pages. The Master Builders Co. **369**

Pozzolith

Owners of 35 water and sewage works report on performance of Pozzolith concrete. 20 pages. The Master Builders Co. **370**

Cement waterproofer

Symentard, a powder to control set and reduce water content of concrete and mortar without entraining air. Sun Chemical Corp. **371**

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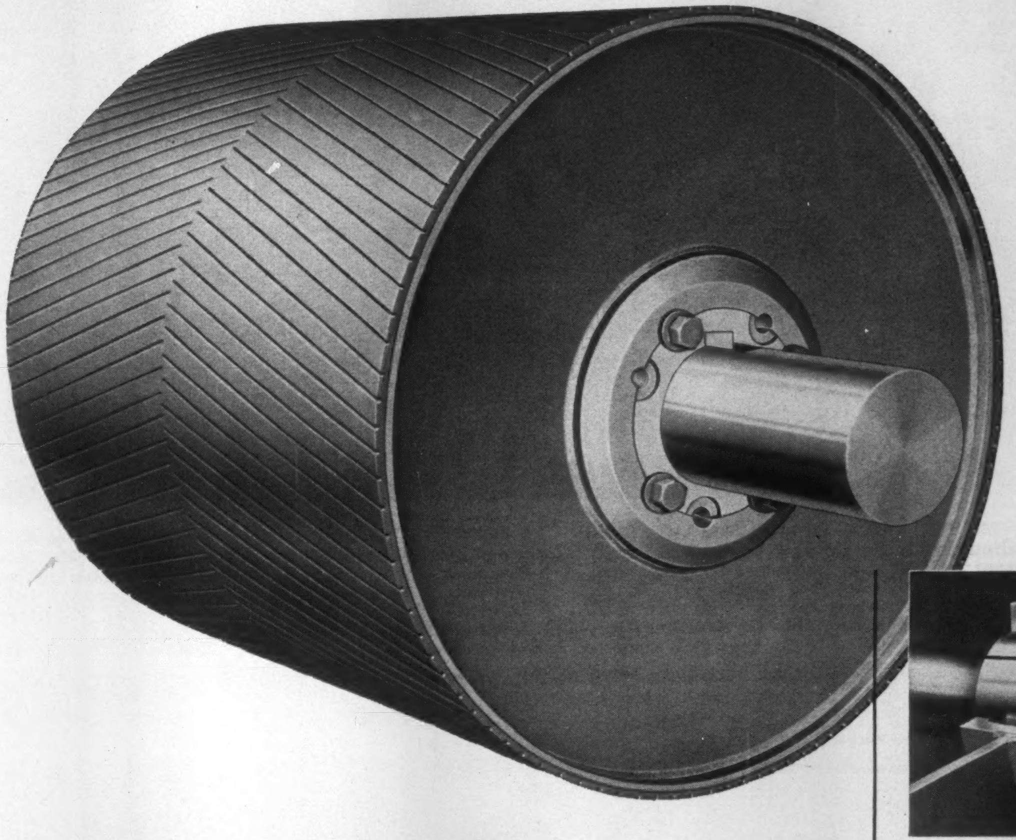


AMERICA'S NO. 1 STEEL CONVEYOR PULLEY!

There are more Taper-Lock Steel Conveyor Pulleys than any other operating on big jobs. Why? Simply because of the dependable performance they deliver under the toughest conditions.

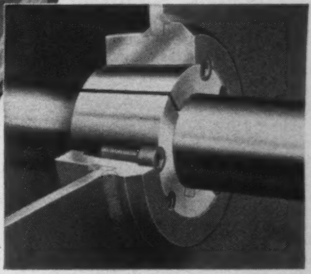
The rims, discs and hubs are *steel* — and they are fused together into jointless drum construction for (1) maximum strength with minimum weight, (2) exclusion of dirt, water and steam, (3) terrific shock resistance. Every weld is made by the submerged arc process giving deep penetration and exceptional strength. Rims are accurately die formed in the smaller diameters and rolled in the larger diameters. Pulleys with 26″ and wider faces have interior discs that add to the trueness, rigidity and strength of the rims.

Dodge offers the world's biggest range of stock sizes. Diameters from 6 inches to 8 feet — all face widths, crowned or flat. Standard or special rubber lagging available. Ask your local Dodge Distributor — or write us for a technical bulletin.

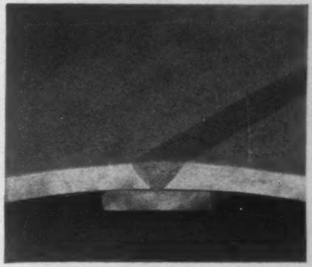
Dodge Manufacturing Corporation, 6900 Union Street, Mishawaka, Indiana

The Products with the Pluses . . . **DODGE**
of Mishawaka, Ind.

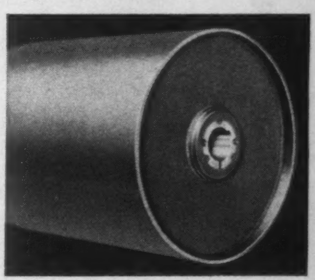
CALL THE TRANSMISSIONEER, your local Dodge Distributor. Look under "Dodge Transmissioneer" in the white pages of your phone book. Factory trained by Dodge, he can give you valuable assistance on new cost-saving methods.



No "walking" on the shaft with Taper-Lock. Full length contact of hub. Holds under heavy loads and shock. Easy on — easy off.



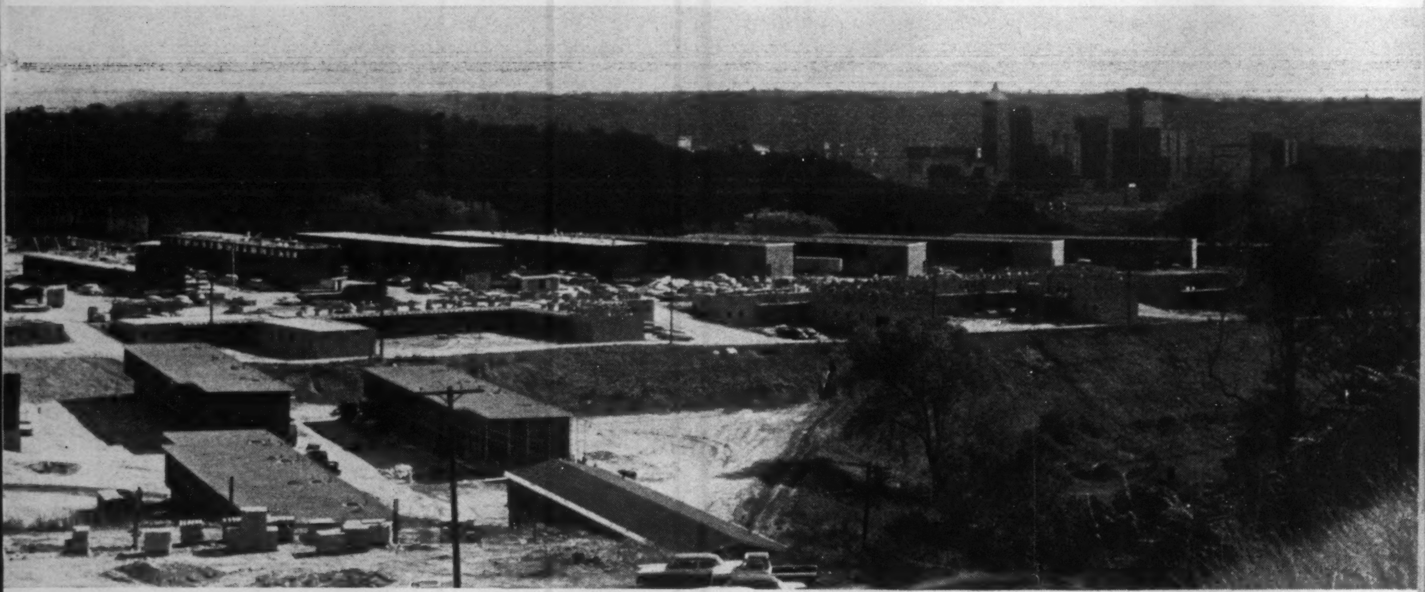
Patented Back-up Bars give full rim strength through 100% weld penetration. Diametrically opposed bars insure balance.

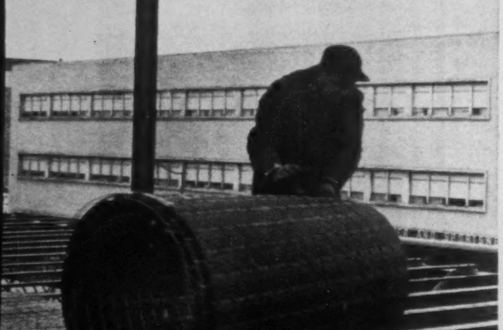


Jointless construction creates a drum fully sealed against conveyed materials of all kinds as well as dirt, water and steam.

▲ IN NEWTON, MASS., 55,000 square feet of Steeltex were installed in floors of South Newton High School. Architect: Korslund, LeNormand & Quann, Inc., Norwood, Mass. Structural Engineer: B. C. Hryniewicz, R. E., of Symmes, Maini & Hryniewicz, Cambridge, Mass. Contractor: M. S. Kelliher Co., Boston.

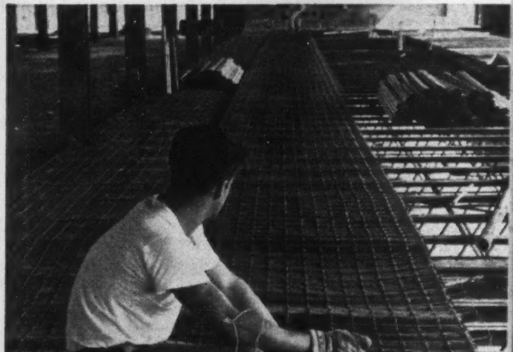
IN PITTSBURGH, PA., 350,000 square feet of Steeltex were installed in floors of the North View Heights Housing Community. Architect: Mitchell, Ritchey, Douden & Simonds, Pittsburgh. Structural Engineer: Leland W. Cook, RPE, Pittsburgh. Contractor: Youngdahl-Crump-Psaty, Pittsburgh. ▼





◀ IN CLEVELAND, at National Cash Register Building, Steeltex is quickly unrolled by one man. Architect: Irving D. Robinson, Cleveland. Contractor: D. W. Rankin, Inc., Cleveland.

IN FOX CHAPEL near Pittsburgh, Steeltex is tightened over joists. At Fox Chapel Area High School 125,000 square feet of Steeltex were used on floors. Architect: Hunter, Campbell & Rea, Altoona, Pa. Contractor: Youngdahl-Crump-Psaty, Pittsburgh. ▶



'Wish We Could Use Steeltex On Every Job,' Says Contractor For $3-¼ Million School

"We're always happy when Steeltex is specified—wish we could use it on every job," said Joe Remaley, pointing to a 125-foot length of the paper-backed, wire mesh reinforcing stretched over steel joists.

"Just unroll it, cut to the length you want, tighten, clip to the joists, pour your concrete and forget about it. It's that simple.

"On top of that," he added, "you know you'll get a good slab reinforced where you want it with good galvanized mesh."

Mr. Remaley referred to use of Steeltex in Fox Chapel Area High School near Pittsburgh. Here 125,000 square feet of Steeltex provided form and reinforcing for floors.

Steeltex' ease of installation was emphasized by John Carey, foreman of the three-man J. C. Jackanic, Inc., installation crew.

Only two men in the crew had used Steeltex before. "But we found Steeltex very easy to install," Mr. Carey explained, "simply by referring to the instruction folder that comes with each box of clips."

● **Steeltex For High School** — In Newton, Mass., during construction of the $3 million South Newton High School, 55,000 square feet of Steeltex were installed in the floors.

Structural Engineer B. Chester Hryniewicz declared: "In preparing detailed cost analyses for different types of floor construction, I have found Steeltex with bar joists costs 35 percent less than conventional concrete slab and steel beam construction."

Leonard W. Quann, AIA principal in charge, added: "Here we had a tight construction schedule and weight was a factor, too, because most of the buildings were constructed on piles. As a result, Steeltex was chosen without question."

The architectural firm of Korslund, LeNormand & Quann was awarded a citation for this school by the American Association of School Administrators.

● **Steeltex For Housing Project**—Steeltex was commended also during construction of the $17 million North View Heights Housing Community for the Pittsburgh Housing Authority. More than 350,000 square feet of Steeltex are used in low-rent family units.

Joseph Slutsky, AIA, resident architect for Mitchell, Ritchey, Douden & Simonds, said: "You get good solid construction with Steeltex. The paper provides all the form you need while the mesh gives the proper reinforcing."

● **Steeltex For Office Building**—In Cleveland, Ohio, 32,000 square feet of Steeltex in the floors of the new National Cash Register Building drew this comment from Charles Nemec, the contractor's general superintendent:

"When properly installed, Steeltex can save up to 15 percent on concrete because it can be tightened over joists."

Architect Irving D. Robinson said he likes Steeltex because, in addition to reinforcing, it holds moisture, providing proper cure for concrete. "There's no concrete dripping through" he said.

● **Steeltex For College**—"Two men can form with Steeltex faster than six men can form with other materials," said W. D. Foulke, superintendent for Henry Shenk Co. during construction of the $1.5 million addition to Villa Maria College in Erie, Pa. Architect for the job: Nelson, Goldberg & Heidt of Erie.

More than 50,000 square feet of Steeltex were used in the floors. "Steeltex provides a substantial working surface, too," Mr. Foulke continued. "It speeds up concrete pouring and presents no problems in fitting around projections such as pipes and vents."

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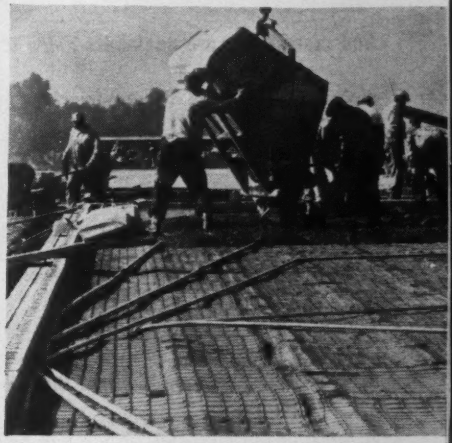

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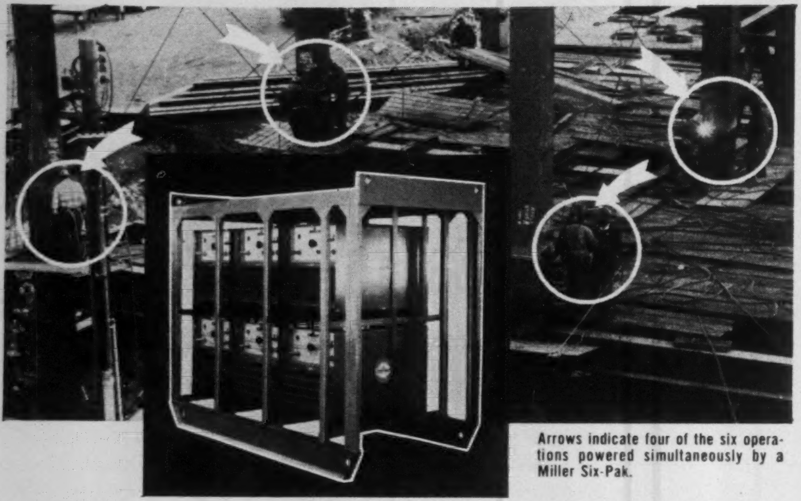

Arrows indicate four of the six operations powered simultaneously by a Miller Six-Pak.

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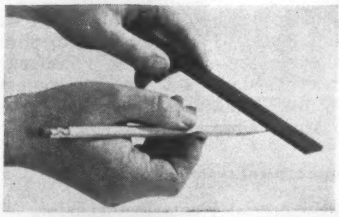

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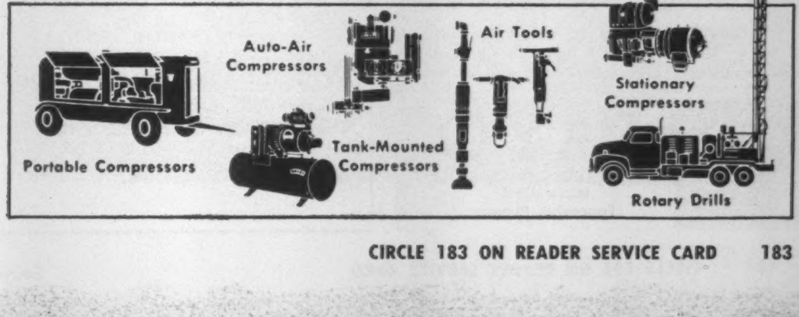

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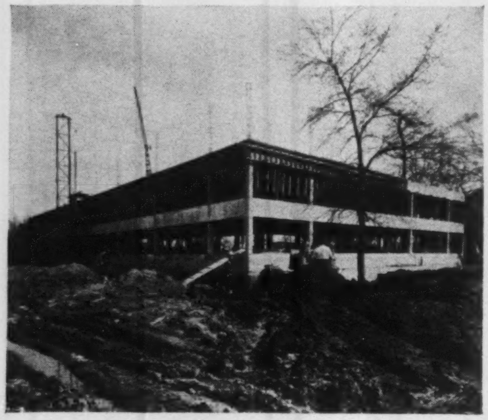

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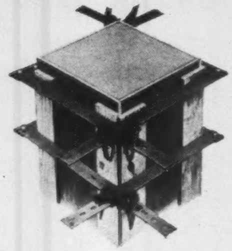

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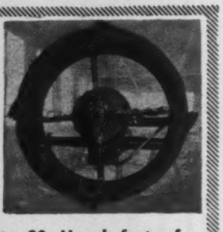

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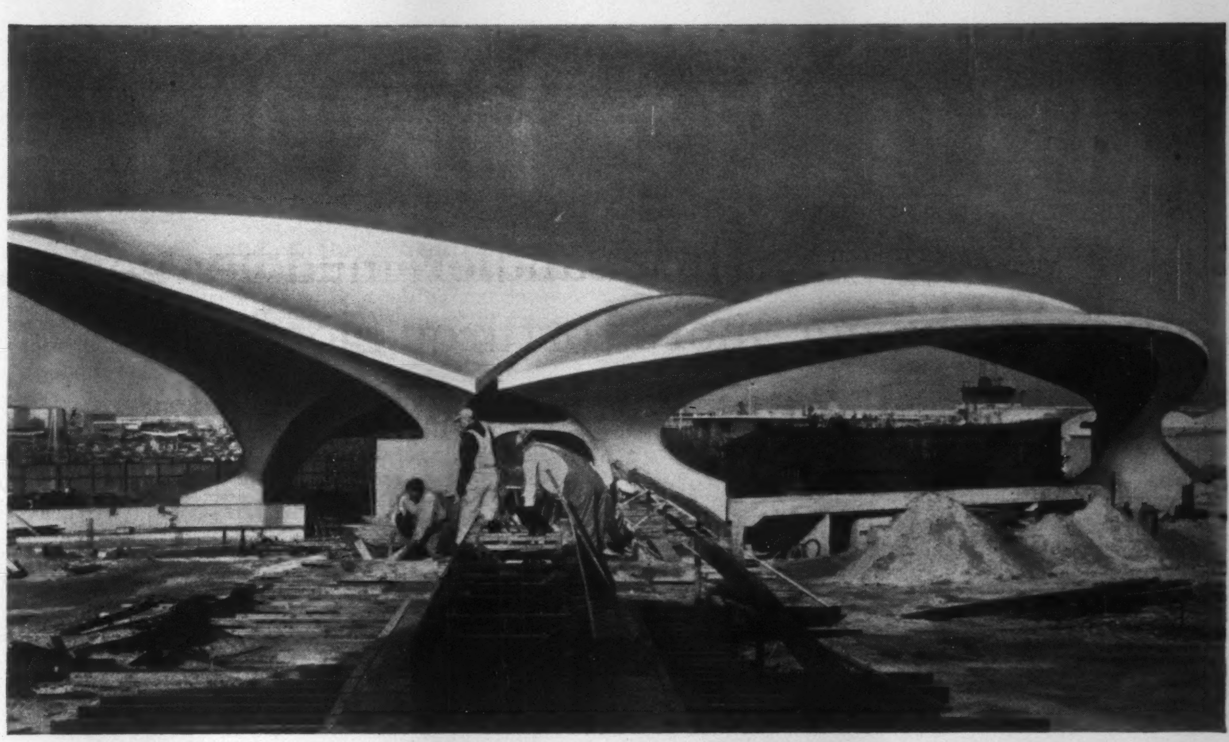

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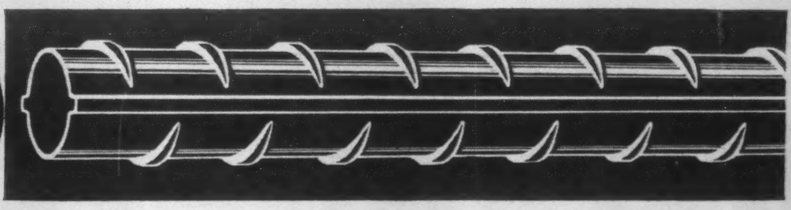

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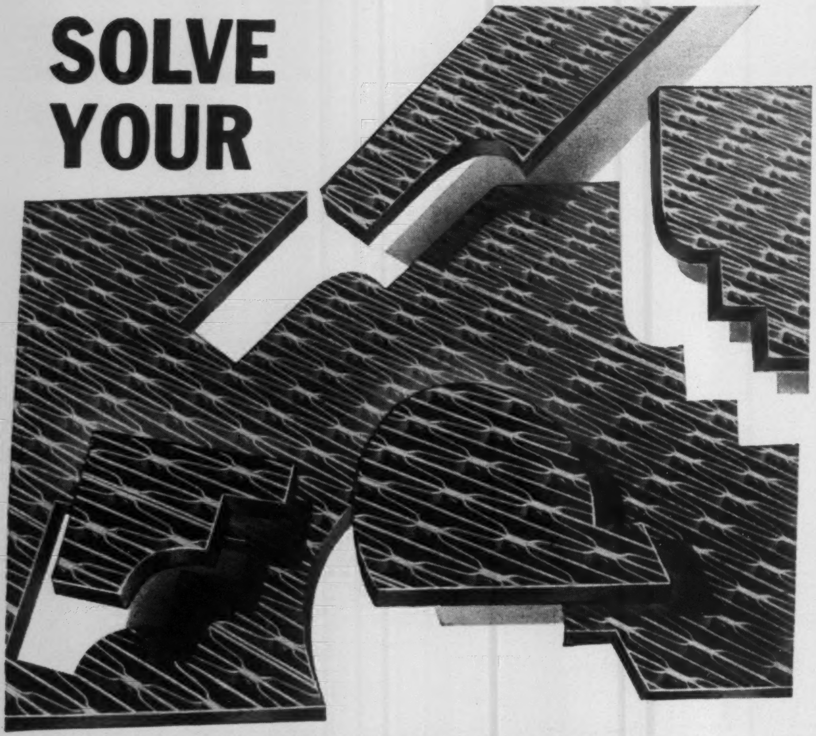

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umbrella, suspended from a space frame cantilevered from the ground. That is one outstanding construction teamwork story.

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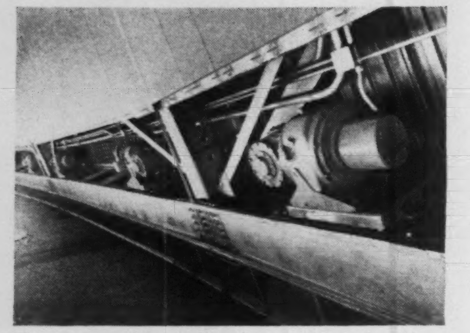

The six movable roof leaves are driven by Westinghouse right angle gearmotors, five to each leaf. Photo shows base of one of the movable leaves with the acoustic ceiling panels removed.

O. M. Newman, Heyl & Patterson, and Edward Cohen, Ammann & Whitney, discuss roof electrical drive with C. G. Falkenstein, Westinghouse, kneeling in front of main roof reactor control cabinet.

unique movable roof drive system is activated. An AC reactor control scheme keeps all six movable leaves in step throughout open and close cycles. Each leaf is driven by Westinghouse Moduline® gearmotors, with opposite leaves being operated in pairs.

Close cooperation among architects, engineers, owner, contractors and Westinghouse helped to provide a system flexible enough to serve varying building demands, with the high degree of electrical reliability required.

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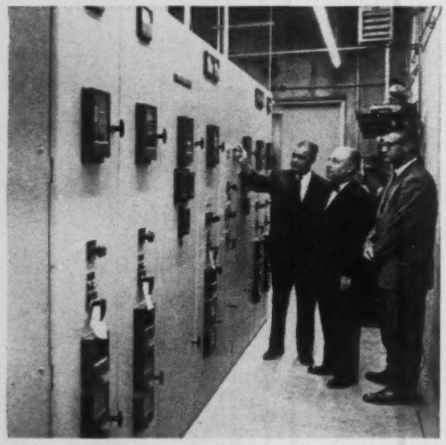
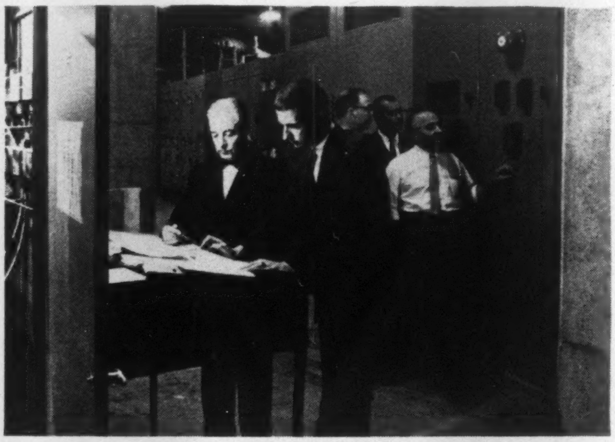
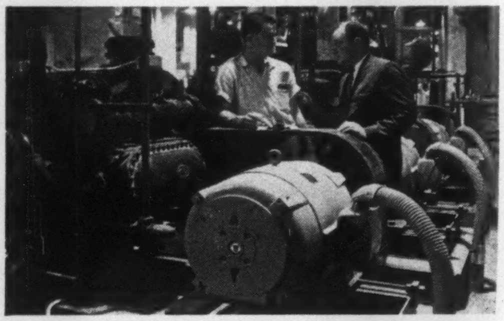


5KV metal-clad switchgear contains a tie-breaker to provide emergency switching between two incoming 4160-V lines. Seen here: N. J. Grady, V. P., Ernst, C. J. Long, and A. B. Janaszek.

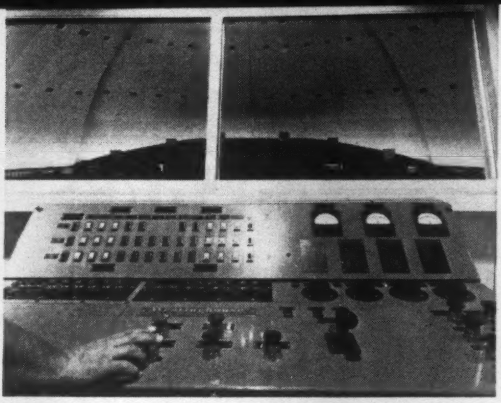


Checking construction progress are C. J. Long and F. J. Sarknas, Westinghouse. In background, 1500 kva power center supplies power for building auxiliary and air conditioning compressor motors.

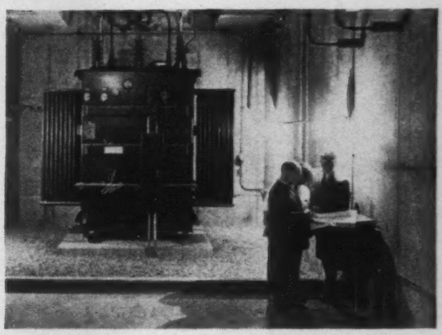
Westinghouse Motor Control Center located in the Mechanical Room centralizes auxiliary motor controls. Discussing installation advantages are H. R. Helvenston, C. J. Long and N. J. Grady.



Three 125 hp Lifeline A motors drive freon compressors to chill brine supply for ice rink piping. Seen here are P. F. Schad, Limbach, and C. G. Falkenstein, Westinghouse.



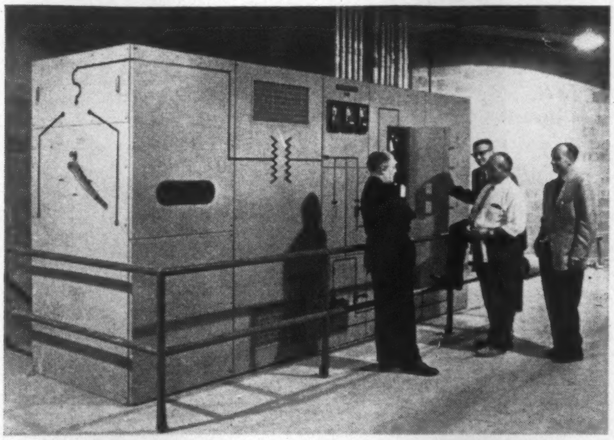
Operator's view from roof control console high above the spectator area. Visible through the glass front is the juncture of the first two movable leaves of the roof.



One of main power transformers rated 2500 kva at 11.6 kv to 4160 volts. Discussing the power supply are C. J. Long, Electrical Engineer, M. A. Geffel, Ernst, and A. B. Janaszek, Westinghouse.

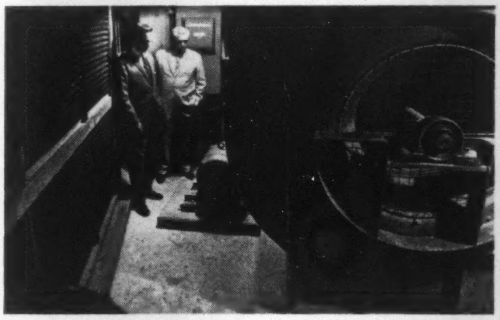
Builder: Public Auditorium Authority of Pittsburgh & Allegheny County: *Resident Engineer & Supt. of Construction:* H. Rey Helvenston
Architects: Mitchell & Ritchey, Pittsburgh
Roof Designers & Engineers: Ammann & Whitney, N.Y.
Electrical Engineer: Carl J. Long & Associates, Pittsburgh
Mechanical Engineer: John Mullin & Associates, Pittsburgh
General Contractor: Dick Corporation, Large, Pa.
Electrical Contractor: E. C. Ernst, Inc., Pittsburgh
Mechanical Contractor: Limbach Company, Pittsburgh
Drive System Contractor: Heyl & Patterson, Inc., Pittsburgh

Westinghouse

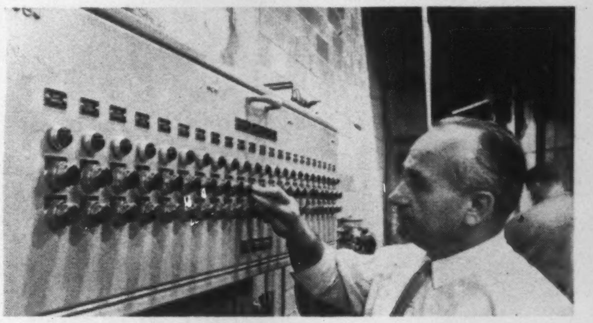


Another Westinghouse power center, this 300 kva ASL dry type supplies lighting and auxiliary power. Discussing its component parts are C. J. Long, A. B. Janaszek, M. A. Geffel and Albert Simon, Ernst.

Type M Electric Stairway transports 8,000 persons /hr. Top to bottom: E. R. Gallagher, supervising architect; H. R. Helvenston, resident engineer; and A. Simmonds, Westinghouse Elevator.



Fan room equipped with series 8000 Air-Foil centrifugal fan and air conditioning coils. W. Y. Humphreys, Westinghouse, with John Mullin, Consulting Engineer, air conditioning and ventilation system designer.



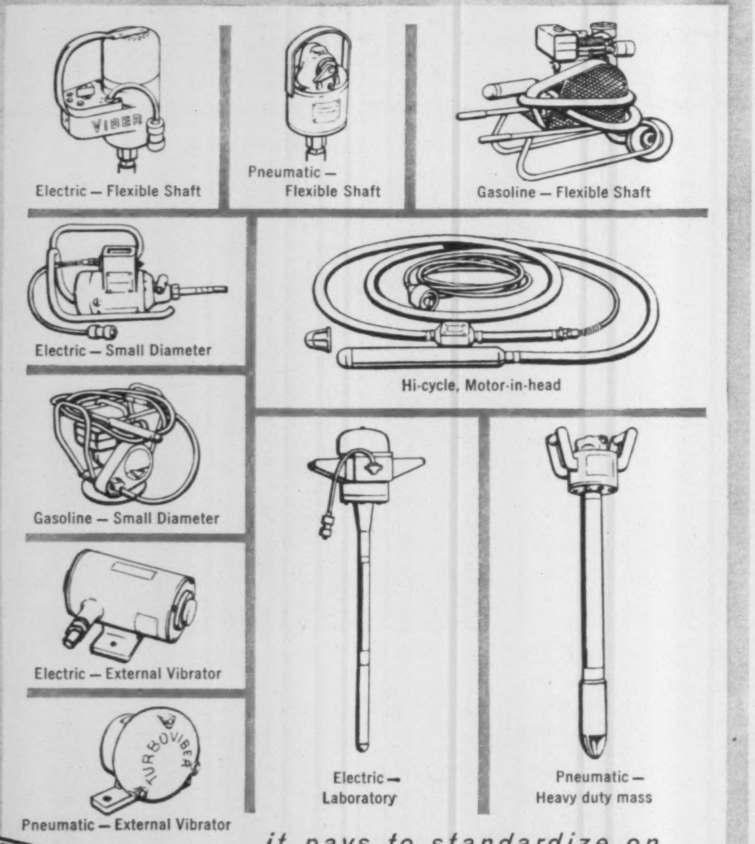
Westinghouse mercury vapor parking area and floodlighting are operated from this remote control panel located in the mechanical room. M. A. Geffel, Ernst, tests lighting circuits.

J-94176-4

VIBER the contractor's most complete line of concrete vibrators!

Complete as a "full house" – that's the Viber line of concrete vibrators. Whatever the project, whatever the consistency of the mix . . . there's a Viber vibrator to do the job right. Standardized units with interchangeable parts make many models adaptable to a wide variety of job conditions . . . reduce your original investment. Simple, rugged Viber design makes servicing easy and keeps maintenance costs low. For answers to concrete vibrating problems, call your Viber distributor or write Viber Company, 726 South Flower Street, Burbank 13, Calif.

SPECIALISTS IN CONCRETE VIBRATORS


Electric – Flexible Shaft
Pneumatic – Flexible Shaft
Gasoline – Flexible Shaft
Electric – Small Diameter
Hi-cycle, Motor-in-head
Gasoline – Small Diameter
Electric – External Vibrator
Pneumatic – External Vibrator
Electric – Laboratory
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Viber Vibrators

Pioneers and leaders in the manufacture of vibrators

CIRCLE 194 ON READER SERVICE CARD

Ball valves

Eight important features that a buyer should look for in a ball valve. Cutaway drawing of one model. Prices and model numbers of each size from 1 to 8 in. Hydromatics, Inc. **398**

Sluice gates

Installation, operation and maintenance handbook on sluice gates. Instructions on handling and storage. Rodney Hunter Machine Co. **399**

Flow meters

Propeloflo Meter, a propeller type totalizing flow meter, for water and other liquids. Eight sizes measure flow from a minimum of 20 gpm up to 2400 gpm. Flow range tables, accuracy curves and typical specifications. B-I-F Industries. **400**

Centrifugal pumps

End-suction straight centrifugal pumps with open or enclosed impeller. For apartment buildings, hotels, etc. Sizes up to 5 in., capacities to 2,000 gpm, heads to 390 ft. Carver Pump Co. **401**

Centrifugal pumps

Close-coupled end-suction centrifugal pumps for cooling towers, air-conditioning systems, boiler feed, condenser circulation and general liquid services. Capacities range up to 1600 gpm, heads to 330 ft, and temperatures to 250 F. Aurora Pump Div., The New York Air Brake Co. **402**

Pumps

Close-coupled "Electropumps," general purpose units. Motors range to 40 hp capacities to 1,000 gpm, heads to 240 ft. Carver Pump Co. **403**

Steel pipe

"Building St. Paul's Big Steel Conduits" describes installation of large diameter pipe in a city water supply system. 16 pages. Bethlehem Steel Co. **404**

Epoxy pipe

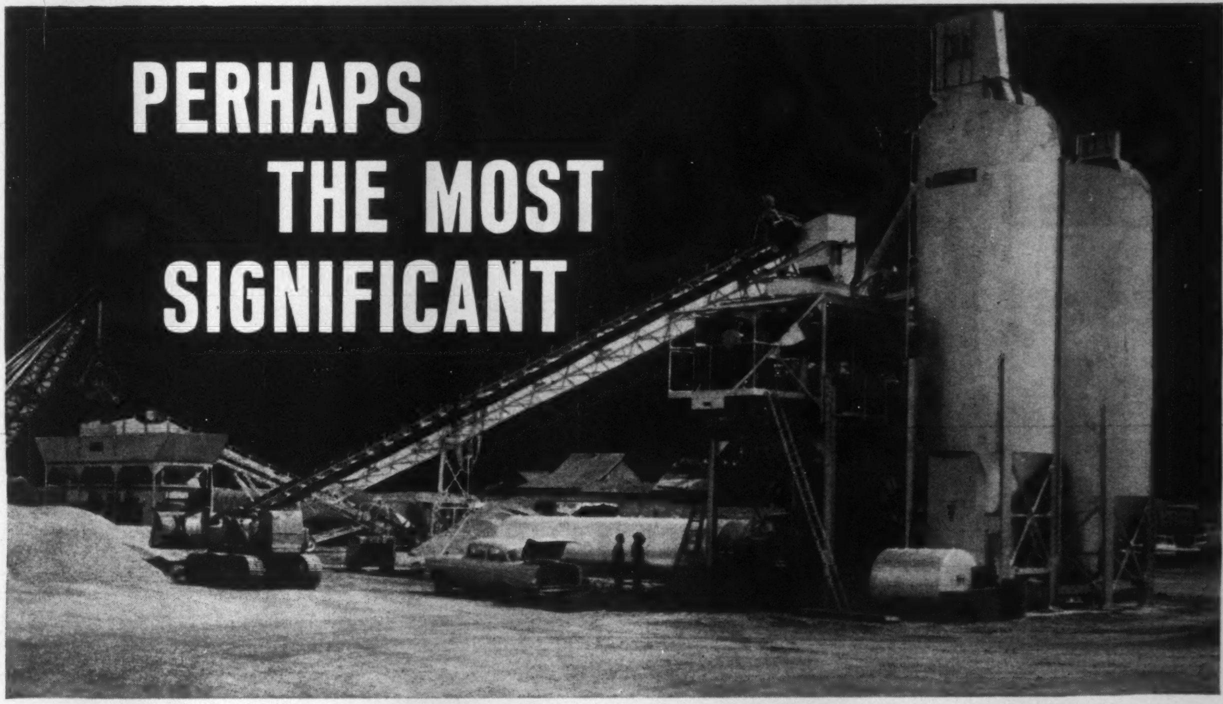
Performance data, specifications and applications for epoxy resin pipe reinforced with glass fiber. Can be used for fluid transmission or construction. Three booklets, 4, 12 and 16 pages. Fibercast Co. **405**

Slotted screen pipe

Descriptions and specifications of slotted screen pipe and wire-wrapped screen for water, oil and gas wells. Eight-page catalog. Emsco Screen Pipe Co. **406**

For More Information . . .

. . . Select the publications you want and circle the key numbers (shown at the end of each item) on the inquiry card at the end of this section.



PERHAPS THE MOST SIGNIFICANT CONCRETE PAVING PLANT EVER BUILT...

for Extremely High Production and Mobility

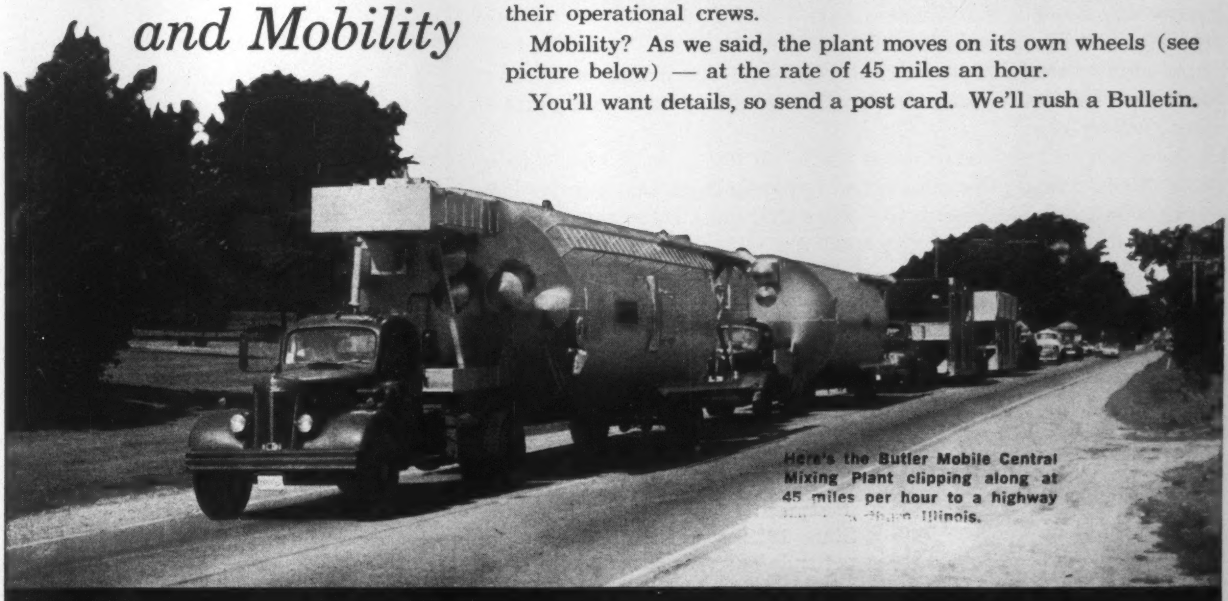
Everything — two big turbine type mixers, cement and aggregate bins, belt conveyors, batchers, fully automated control equipment (completely packaged) — every component on wheels.

It's an entirely new BUTLER Central Mixing Plant for paving — or other construction.

This one plant is engineered to replace 3 or more pavers and their operational crews.

Mobility? As we said, the plant moves on its own wheels (see picture below) — at the rate of 45 miles an hour.

You'll want details, so send a post card. We'll rush a Bulletin.



Here's the Butler Mobile Central Mixing Plant clipping along at 45 miles per hour to a highway [illegible] Illinois.

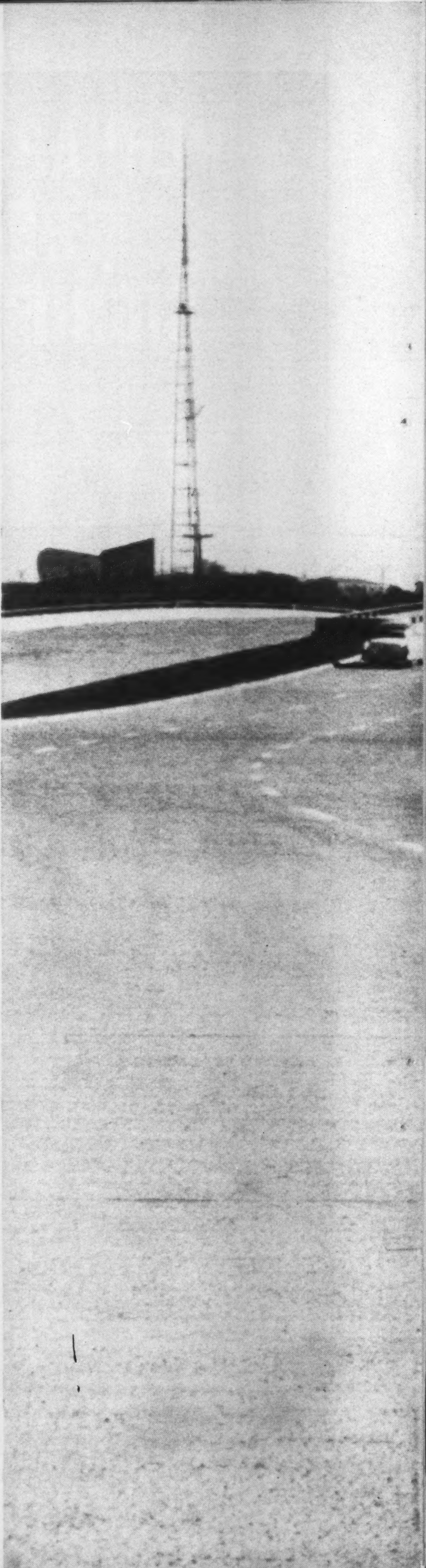
BUTLER BIN COMPANY

947 Blackstone Avenue • Waukesha, Wisconsin

CIRCLE 195 ON READER SERVICE CARD

INTERSTATE

Texas' 352 miles of Interstate awarded to concrete promise big savings in upkeep!



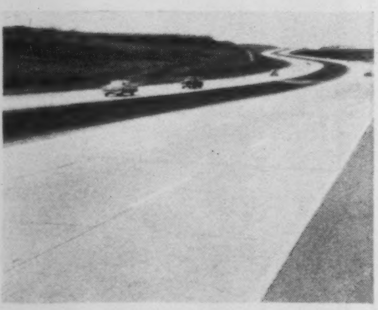
Across Texas, these modern concrete highways are steadily growing in length. They will long be a public reminder of the skills and dedication of the engineers and builders who are creating them.

A solid future is built right into roads like these. Only concrete has load-bearing strength that can be matched *mathematically* to future traffic needs. Only concrete enables engineers to design pavements to last 50 years and more.

Concrete isn't flexible, so there are no "moving parts" in it to cause hidden wear. And even with the highest temperatures, it won't soften and ripple under traffic. Concrete can't oxidize. There's never adverse chemical reaction to sun, cold, air or moisture. Concrete actually grows stronger year by year.

All these advantages mean extra thrift for Texas as it builds with concrete: Exceptional pavement life . . . upkeep costs that run far less than for asphalt. It's for reasons like these that most Interstate mileage across the nation today is going to concrete.

At right: Texas Interstate 35E, Stemmons Freeway out of Dallas.
Below: Texas Interstate 20, Dallas—Ft. Worth Turnpike.

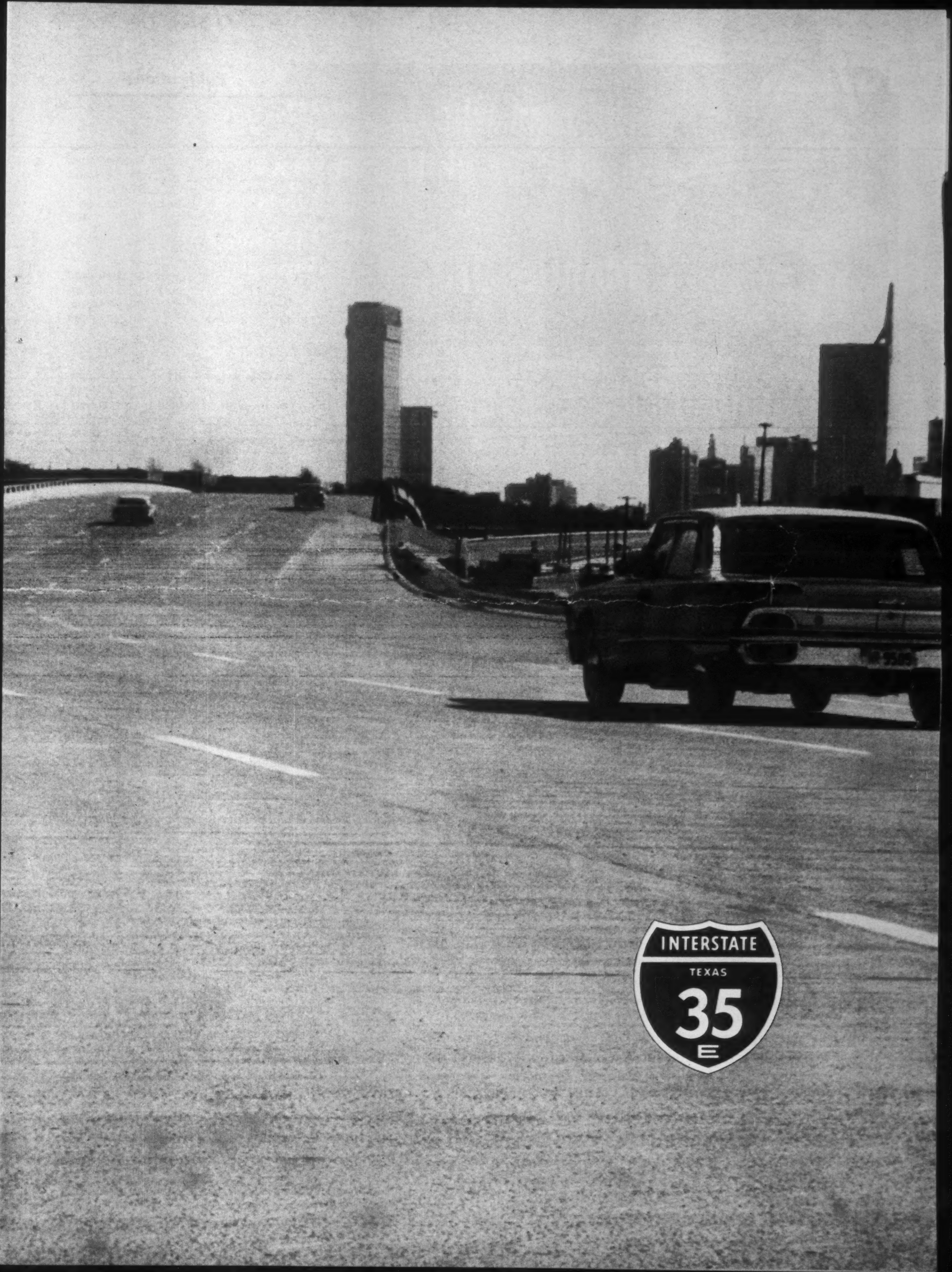


38% maintenance saving with concrete, Texas' 31-year records show!

Official Texas State Highway Department records give the facts: Since 1929, road maintenance costs per mile per year for concrete have averaged $144.68; for asphalt, $235.23. Texas' new concrete highways will do even better!

PORTLAND CEMENT ASSOCIATION

A national organization to improve and extend the uses of concrete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TEXAS
35
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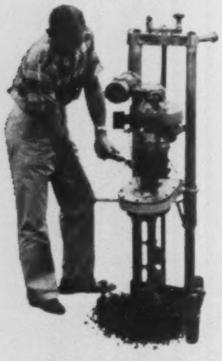
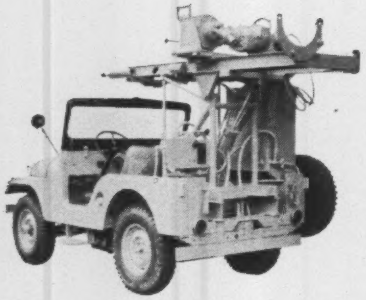
Mobile B-52



Minuteman



Mobile B-40

Get MOBILEized for Contracting • Mineral and Aggregate Prospecting • Soil Sampling • Foundation Testing • Bridge Soundings • Core Drilling • Cathodic Protection • Water Well and Blast Hole Drilling • Utility and Pile Drilling

Write for new Mobile Drill Catalog No. 615

MOBILE DRILL

MOBILE DRILLING, INC.
Dept. 25 • 960 N. Pennsylvania St.
Indianapolis 4, Indiana

Water pipe

Cement mortar lined and reinforced cement mortar coated steel water pipe. Federal specifications, design tables and friction loss table on sizes ranging from 4 to 48 in. 16 pages. Southern Pipe, Div. of U. S. Industries, Inc. **407**

Color-coded conduit

Sherarduct rigid steel conduit, galvanized and coded in five polyvinyl finishes. Four pages. National Electrical Division, H. K. Porter Co., Inc. **408**

Trench conduit

Asbestos-cement conduit for outside applications. Wall thicknesses 0.35 to 0.40 in. for Type II and 0.25 to 0.30 in. for Type I. Type II requires no concrete reinforcement when installed underground. Inside diameters to 6 in. 12 pages. Johns-Manville. **409**

Fiber pipe

Applications for bituminized fiber pipe in industrial plants and homes. Bermico Div., Brown Co. **410**

Plastic conduit

Rigid polyvinyl-chloride conduit, 12 diameters, to 6 in. Above and below-ground installation. Eight pages. Lasco Industries. **411**

Plastic pipe and fittings

Catalog of polyvinyl chloride, polyethylene and acrylonitrile-butadiene-styrene pipe and tubing. Lists sizes available, working pressures, weights, prices, etc. Lascopipe. Lasco Industries. **412**

Plastic pipe and fittings

Installation information and specifications for underground plastic conduit and fittings and for light wall and heavy wall polyvinyl chloride pipe. Two brochures. Consolidated Pipe Co. **413**

Pipe equipment

Repair sleeves, test plugs, and connecting sleeves. Tools for cutting and handling pipe. Flexible socket valve wrench. Four pages. James B. Clow & Sons. **414**

Clamps, couplings and joints

Brochures covering clamps, couplings and joints for maintenance and original equipment use. Detailed information on sizes. Illustrations and dimensional diagrams. Marman Div., Aeroquip Corp. **415**

For More Information . . .

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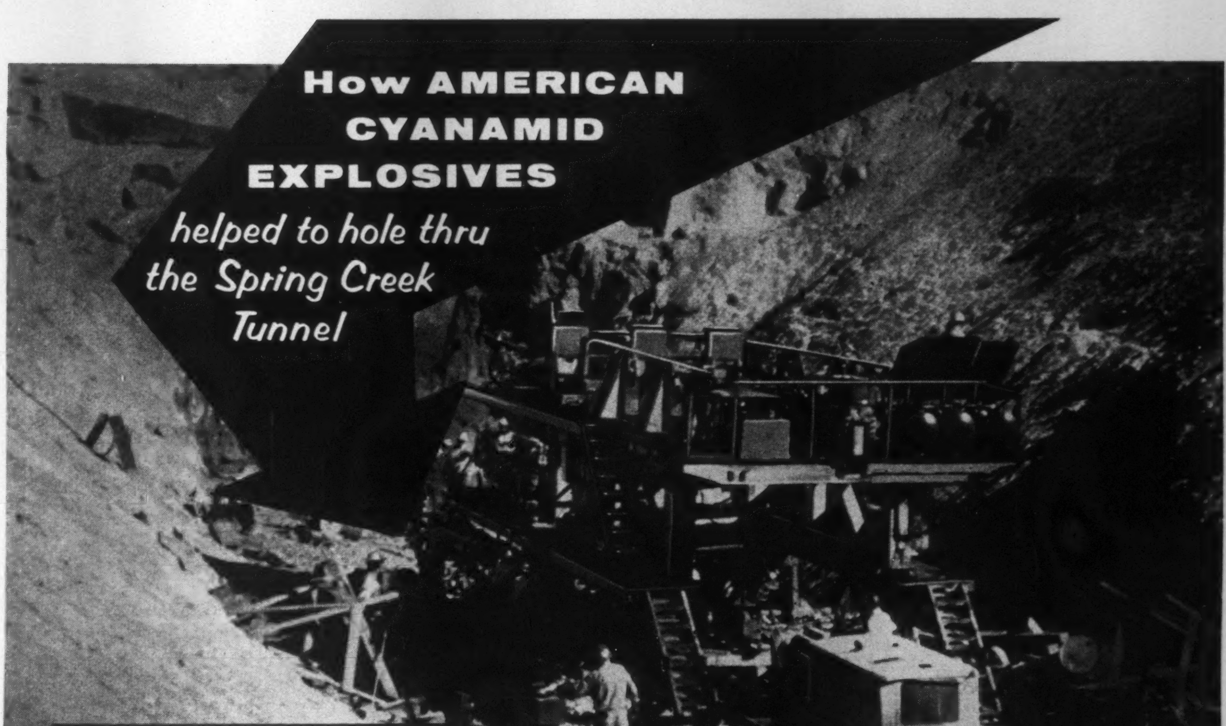
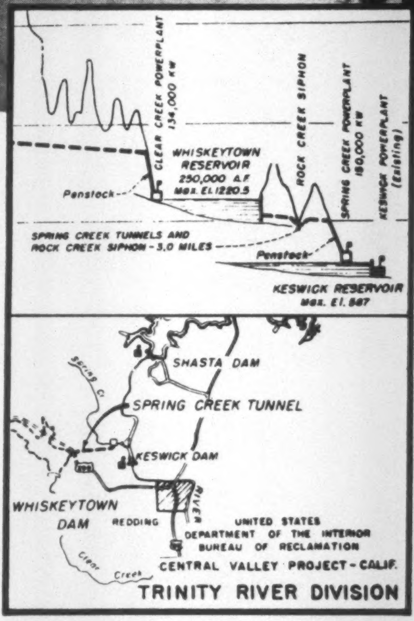
How AMERICAN CYANAMID EXPLOSIVES

helped to hole thru the Spring Creek Tunnel




CLEAR CREEK POWERPLANT 134,000 KW
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SPRING CREEK POWERPLANT 180,000 KW
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Penstock
KESWICK RESERVOIR Max. El. 587
SHASTA DAM
Spring Cr.
SPRING CREEK TUNNEL
KESWICK DAM
WHISKEYTOWN DAM
REDDING
RIVER
UNITED STATES DEPARTMENT OF THE INTERIOR BUREAU OF RECLAMATION
Clear Creek
CENTRAL VALLEY PROJECT - CALIF.
TRINITY RIVER DIVISION

Contractor personnel for Winston-Green-Drake Construction Co.: Jack Feller, Project Manager; Hank Parker, Project Engineer; Chuck Pierson, Project Supt.; Lee Kennard, Ralph Edwards and Johnny "Okie" Pillows, Heading Supts.

Key to California's Trinity River Basin flood control and irrigation project is the diversion of excess flow from the Trinity River into the Whiskeytown Reservoir and on through the Spring Creek Tunnels and Rock Creek Siphon into the Sacramento River. This ingenious combination of regulating reservoirs and diversion tunnels will handle a flow of 3,600 cfs and produce up to 380,000 KW in 3 hydroelectric plants.

Key contract in this major U. S. Bureau of Reclamation project is the 2.4 mile 17-foot diameter Spring Creek Tunnel now being holed through by Winston-Green-Drake Construction Company, a joint venture.

This job involves two tunnels (8200′ and 4500′) driven from four headings, with the Rock Creek Siphon in-between. Each jumbo drove one-half of each tunnel and, working from the opposite face, is holing through at the center of each tunnel. Rock is intensely metamorphosed with many slip-faults and weak spots necessitating close supervision of drilling, shot pattern and loading.

Rounds are drilled 4′ to 6′ depending on the face condition with 65 to 70 holes per round drilled by seven 1¾″ carbide bits on each of the two three-deck jumbos. Each hole is loaded with one stick of 1¼″ Cyanamid 40% Standard Gel followed by five sticks of Cyanamid 1¼″ Ammonia Type Dynamites. Explosives ratio is approximately 2.5 lb. per cubic yard. Total advance on two faces averages 7 feet per shift. Crews report excellent shooting, no fume-headaches and no bootleg on any shots with Cyanamid explosives.

Explosives for the Spring Creek Tunnel Job were delivered on schedule by Alpha Industrial Supply, Nevada City, California, working in close cooperation with Cyanamid's Salt Lake City office.

Cyanamid offers a complete line of dependable high quality explosives, promptly delivered with distributor service coast to coast, plus cost-cutting assistance in their best use.

AMERICAN
CYANAMID
EXPLOSIVES

AMERICAN CYANAMID COMPANY
EXPLOSIVES AND MINING CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY

Explosives • Electric Blasting Caps and Accessories
Blasting Agents • Chemical Grout • Mining Chemicals

SAVE 1/3 THE STEEL
SAVE 1/3 THE CONCRETE

Republic High Strength Reinforcing Bars save you up to ⅓ the steel, or ⅓ the concrete, or both.

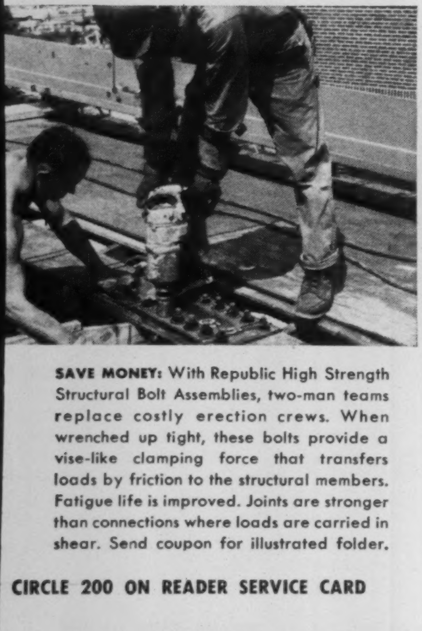
With yield strengths ranging from minimums of 60,000 and 75,000 psi, these bars provide a higher design stress. You gain usable floor space as you trim the size of columns. You cut dead load and overall building height as you trim slab thickness. The use of lighter members permits greater flexibility in design. You save construction time and money by the overall materials reduction.

Used in columns, foundations, slabs, continuously reinforced highway paving, missile sites, dams, and other applications, Republic High Strength Reinforcing Bars are produced to ASTM Specifications A-432 (60,000 lbs. minimum yield) and A-431 (75,000 lbs. minimum yield)—from new billet steel only.

Republic is the world's largest producer of carbon and alloy steel bars. Plants in Buffalo, Chicago, Cleveland, Gadsden, and Youngstown assure rapid delivery. All standard sizes including 14S and 18S are available. For complete information, contact your nearest Republic representative or mail the coupon.

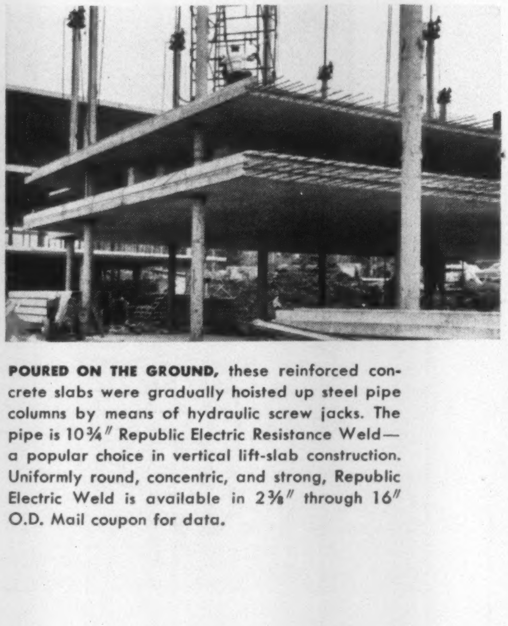
REPUBLIC STEEL

REPUBLIC HAS THE FEEL FOR MODERN STEEL



SAVE MONEY: With Republic High Strength Structural Bolt Assemblies, two-man teams replace costly erection crews. When wrenched up tight, these bolts provide a vise-like clamping force that transfers loads by friction to the structural members. Fatigue life is improved. Joints are stronger than connections where loads are carried in shear. Send coupon for illustrated folder.

SAVE TIME: With Republic Sectional Plate Pipe-Arch, a six-man crew completely assembled this 146-foot pipe-arch in just four days. The 22-ton structure was then lifted by cranes into the excavation. Total placement time—2½ hours. This pipe-arch was made of 8-gage corrugated sectional plate, measured 10'11" wide by 7'7" high. Send coupon for complete information.



POURED ON THE GROUND, these reinforced concrete slabs were gradually hoisted up steel pipe columns by means of hydraulic screw jacks. The pipe is 10¾" Republic Electric Resistance Weld—a popular choice in vertical lift-slab construction. Uniformly round, concentric, and strong, Republic Electric Weld is available in 2⅜" through 16" O.D. Mail coupon for data.

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Strong
Modern
Dependable

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Please send more information on:
- ☐ High Strength Reinforcing Bars
- ☐ High Strength Structural Bolt Assemblies
- ☐ Sectional Plate Pipe-Arch
- ☐ Electric Resistance Weld Pipe

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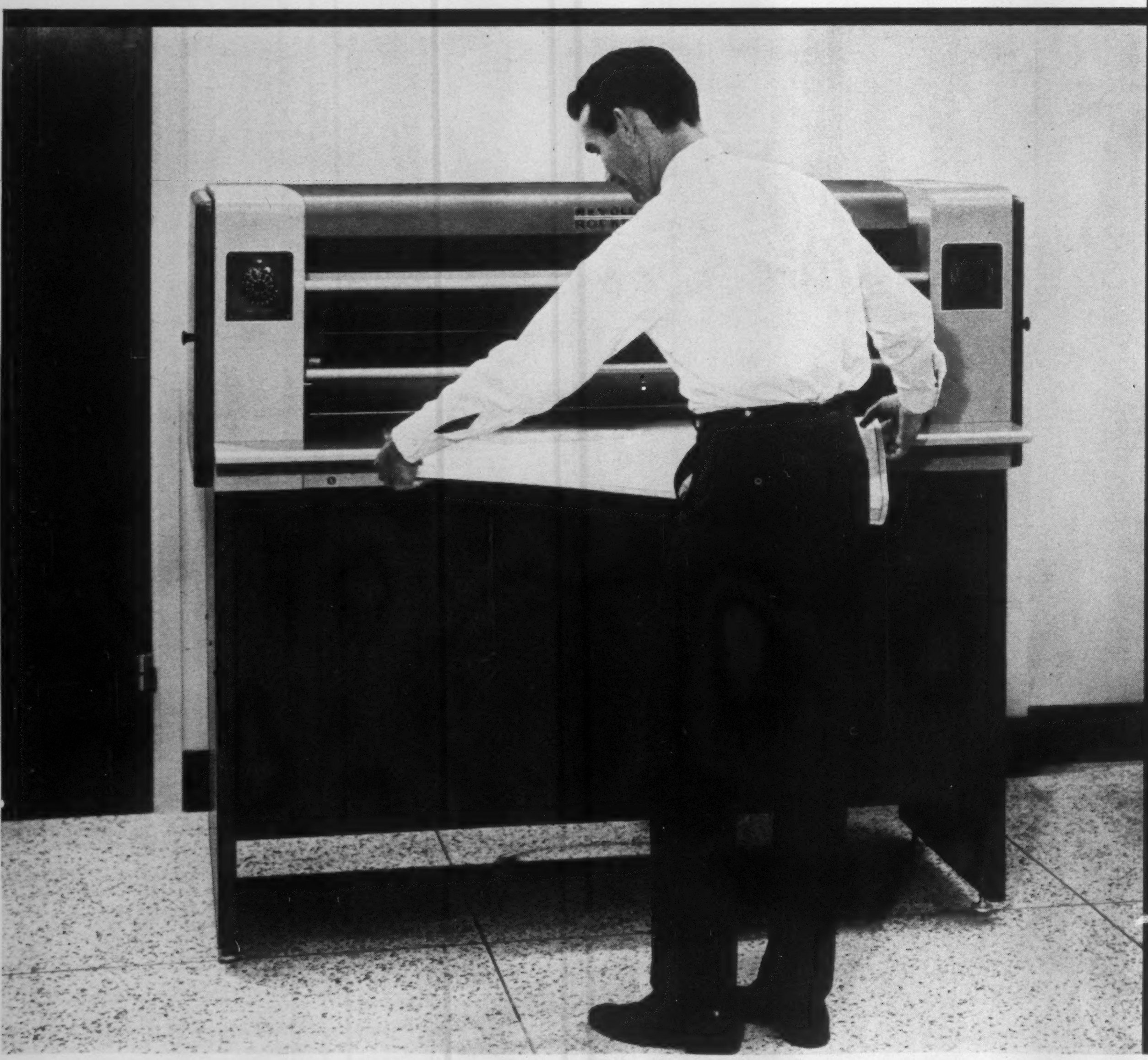
HERE IS THE **NEW** REVOLUTE **ROCKETTE** THIS **VERSATILE** WHITEPRINTER BRINGS YOU FAMED **REVOLUTE QUALITY**, FULL 42" PRINTING WIDTH, YOUR CHOICE OF **3 MODELS**-AT PRICES THAT START **BELOW $1600**



here's good news

for the company or department that "couldn't afford" a big-production whiteprint machine. You can now! These new Rockettes start below $1600. Yet look what they offer—*compare* what they offer with any other whiteprinter made:

- Full 42" printing width.
- Your choice of wattages and printing speeds: 30, 40, or 60 watts...15, 25, or 35 fpm.
- Revolute's exclusive perforated roller developing unit. Shortens print travel, saves ammonia. Assures fast print return, uniform print quality.
- Automatic developer control. The Rockette has an automatic pump as standard equipment.
- Table-top or floor stand model, as you prefer.

If you know Revolute, you know it stands for the very best. Yet here is this new Revolute Rockette, priced with the very lowest! For the full story of specifications and costs—simply mail the coupon.

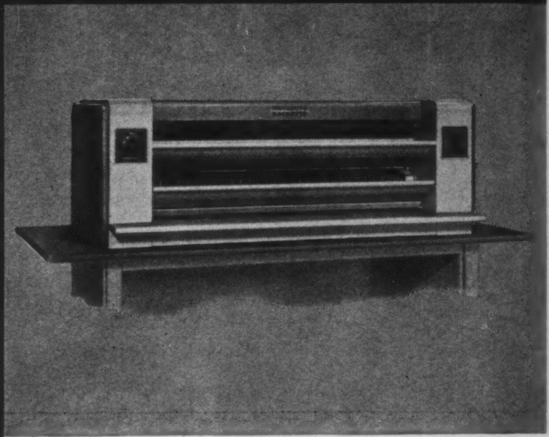
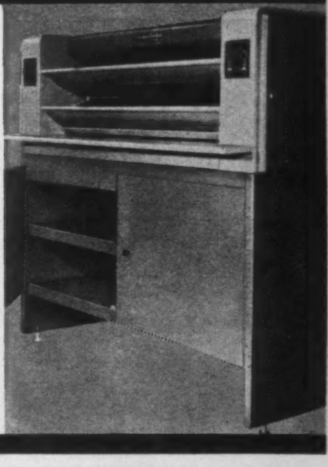
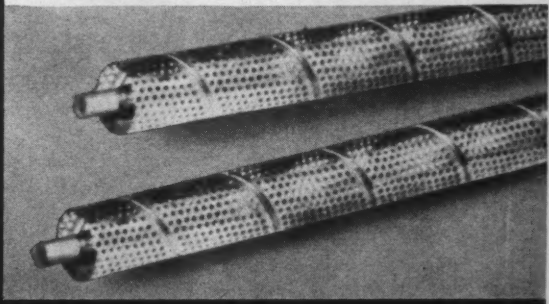


TABLE-TOP ROCKETTE has all the performance features of the floor stand model: three printing speeds, each with automatic developer control.

ROCKETTE FLOOR STAND provides deep, roomy storage area for sensitized, material supplies.



PERFORATED ROLLER DEVELOPING UNIT ...a Revolute exclusive...assures uniform print quality, fast print return.



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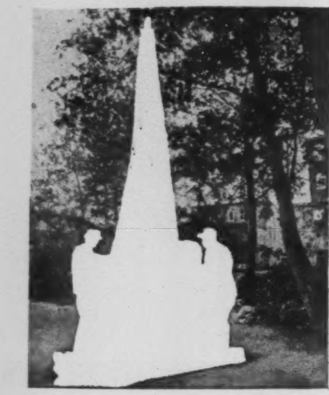

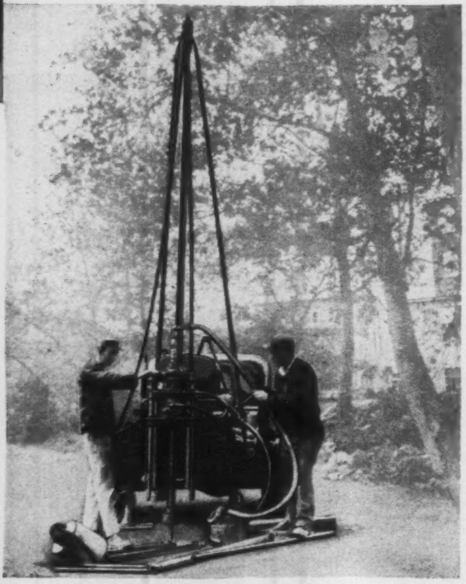

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. . . Publications

Self-sealing couplings

Booklet gives common uses of self-sealing couplings in fluid piping systems. 19 pages. Aeroquip Corp. **416**

Flexible flanged couplings

How these fittings can be incorporated into water, sewage, or gas systems or used in existing pipelines. Design drawings, charts show range of pipe sizes and flanged fittings that can be accommodated. Smith-Blair Inc. **417**

Chemical feeders

Table feeder for volumetric feeding of fluoride compounds to a water treatment system at feed rates from 4 oz to 20 lb an hour. Chem-O-Feeder diaphragm type chemical-solution feeder for water systems of capacities up to 25 gpm. Two brochures. B-I-F Industries. **418**

Incandescent fixtures

For recessed mounting in suspended acoustical ceiling tiles. Installation accessories. Specifications. Four pages. Kurt Versen Co. **419**

Incandescent fixtures

For recessed mounting in suspended ceilings. Controlens fixtures with concave, convex and plane lenses. Coefficients of utilization, foot-lambert distribution. Specifications. Eight pages. Holophane Co., Inc. **420**

Plumbing fixtures

Roughing-in dimensions and installation methods for representative selection of lavoratories, water closets, bathtubs, urinals, supply and waste fittings, drinking fountains, utility and kitchen sinks. Over 100 pages. Crane Co. **421**

Fence-gate operators

Electric-pneumatic operators for sliding, swinging and lifting wire fence gates. Ten standard systems, others designed on special request. Four pages. Robot Industries, Inc. **422**

Methods

Fallout shelter

Complete building plans, including bill of materials and material specifications for above-grade, basement and underground fallout shelters. Plywood and lumber construction. Ventilating details. Douglas Fir Plywood Association. **423**

For More Information . . .

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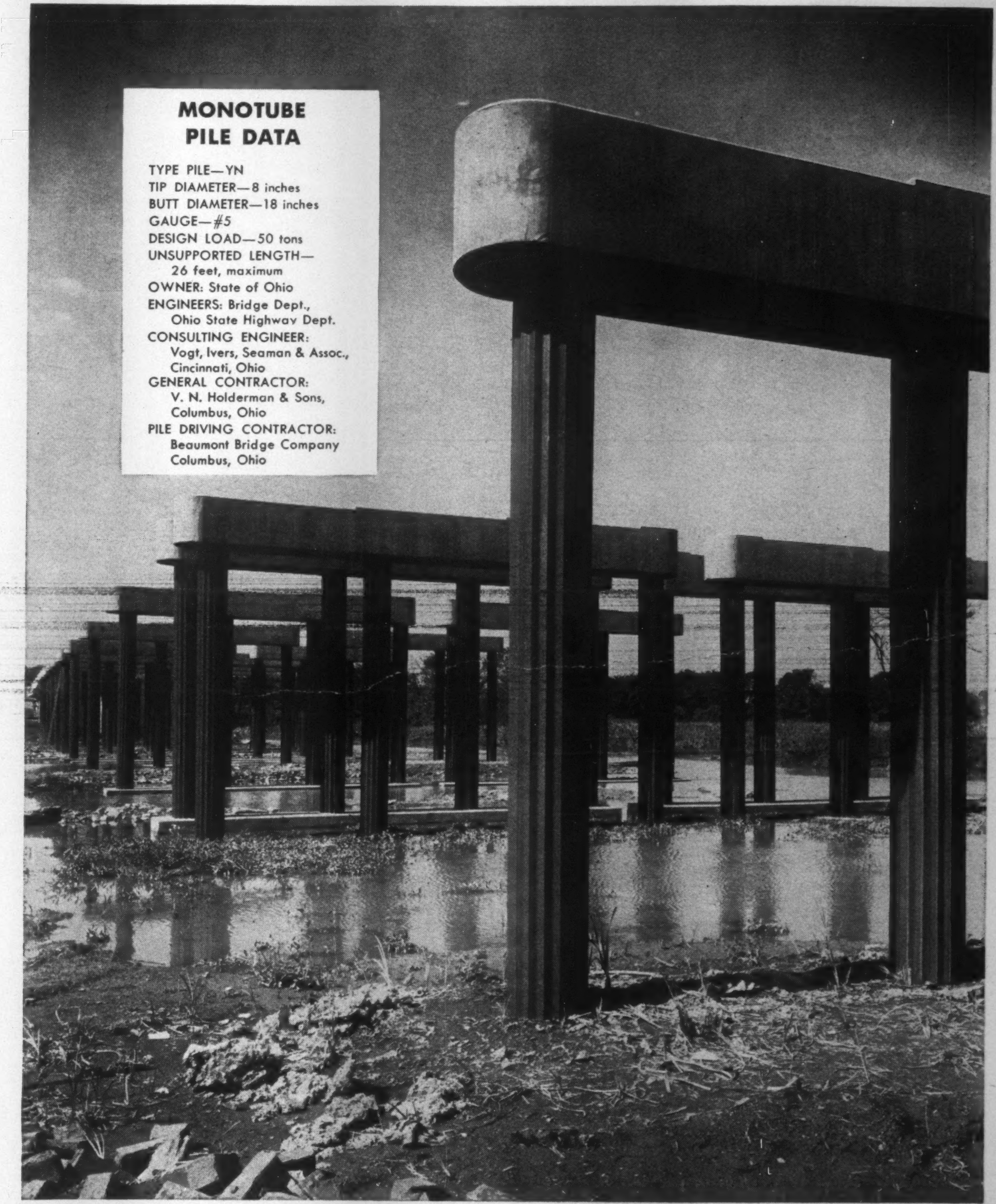


MONOTUBE PILE DATA

TYPE PILE—YN
TIP DIAMETER—8 inches
BUTT DIAMETER—18 inches
GAUGE—#5
DESIGN LOAD—50 tons
UNSUPPORTED LENGTH—
  26 feet, maximum
OWNER: State of Ohio
ENGINEERS: Bridge Dept.,
  Ohio State Highway Dept.
CONSULTING ENGINEER:
  Vogt, Ivers, Seaman & Assoc.,
  Cincinnati, Ohio
GENERAL CONTRACTOR:
  V. N. Holderman & Sons,
  Columbus, Ohio
PILE DRIVING CONTRACTOR:
  Beaumont Bridge Company
  Columbus, Ohio

VERSATILITY plus ECONOMY with Monotube piles. When soil conditions at this site in Mansfield, Ohio, prohibited conventional construction in crossing low-lying land, this adaptation of a foundation supported on Monotube steel piles proved to be an economical solution.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL

Monotube Foundation Piles

MISSILE CITY
ROCK CORP.
LOMPOC CALIF.

speeds production

LeTOURNEAU-WESTINGHOUSE
7

with Haulpak® trucks

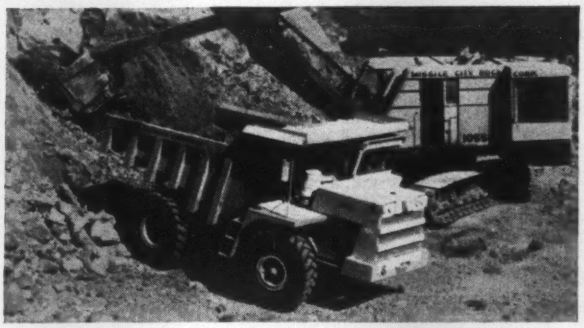
Almost overnight, Lompoc, California, once known mainly as "the flower-seed capital", has become a focal center of the Pacific Missile Range. At such nearby installations as Los Alamos, Vandenberg Air Force Base, and the Navy's Point Arguello, launching pads, roads, and other facilities are being built at a record pace. Much of the high-grade aggregate for these projects is supplied by Missile City Rock Corporation from its big, new, crushed-stone plant.

To keep raw materials flowing to the crusher at a steady rate, the firm works 3 LeTourneau-Westinghouse 32-ton Haulpak trucks. Here's a pictorial report of these 380-hp haulers at work.

We will give you complete information on LW Haulpak trucks. 5 end-dumps, 22 to 65 tons, up to 550 hp. 90-ton bottom dump also available.

◀ 3,000 tons of overburden and rock is the average 8-hr-shift production for Missile City's 3 LW Haulpaks. Haul measures 2,500 feet, most of it down steep, winding 10% grade. Exclusive Hydrair® suspension keeps load riding level, cushions load and road shocks, gives longer tire life. In addition, this LW air-hydraulic suspension system eliminates springs, front axles, and related maintenance.

▲ Operators highball the 32-ton Haulpaks down narrow winding road. High, off-set cab with non-glare, canted windshield gives operator good visibility. Other safety factors that give him confidence to work at fastest practical speeds: low center of gravity . . . LW power steering . . . and air-craft type multi-disc air brakes (5,148 square inches of braking surface).



▲ Short 44'6" turn radius of the 32-ton LeTourneau-Westinghouse Haulpak permits fast positioning under dipper. And look at the extra load capacity you get within short 10'10" wheelbase. Deep V-body carries up to 8 tons of material *below* normal floor line . . . giving Haulpak low center of gravity, exceptional stability — on turns and slope work.

▲ One of Missile City Rock Corporation's Haulpaks dumps rocky overburden at waste bank. Note that the twin 3-stage hoists are inverted to shed abrasive dust and dirt. Straight, smooth body floor, with no "kick up" at back, speeds ejection. Exhaust-heated body prevents material from sticking.

HP-2435-GJ-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

CIRCLE 207 ON READER SERVICE CARD

LeTOURNEAU LW® WESTINGHOUSE

How come Joe can bid so low on those concrete jobs he's getting?

Uses UNI-FORM Panels. Says they're the fastest, cheapest method of forming concrete he's ever used.

Think he's right?

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TITLE__________
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UNIVERSAL FORM CLAMP CO.
1238 N. Kostner Avenue, Chicago 51, Illinois

Concrete fallout shelter

How to build a concrete fallout shelter. Plans, forming material, bill of material and cost of material. Universal Form Clamp Co. **424**

Snow moving

Describes the use of motor graders and wheel loaders in snow removal. Caterpillar Tractor Co. **425**

Snow melting systems

Buried copper tubes for keeping walks, driveways and parking spaces free of snow. Compares grid and continuous coil systems. Tells how to lay tubes in asphalt and concrete. Eight pages. Revere Copper and Brass Inc. **426**

Dewatering

"How to Dewater"—a 52-page illustrated book of basics, product descriptions and methods of dewatering various sites. Case histories. John W. Stang Corp. **427**

Water analysis

Procedures for various tests. Sections on laboratory chemicals and apparatus. 72 pages. Hach Co. **428**

Electrodialysis

Electrodialysis method of demineralization—converting brackish water to fresh, pure water or recovering chemicals. For municipalities, motels, hotels, industrial plants. Details of process and description of equipment. Aqua-Chem, Inc. **429**

Mortaring pipe joints

Mortaring of sewer and pressure pipe joints using steel strapping to hold diaper forms. Form can be used with hot joints on vitrified clay and cold joints on concrete pipe. Acme Steel Co. **430**

Pressure blasting

Report on manufactured abrasives, Alundum and Arrow-Blast aluminum oxides and Crystolon silicon carbide for cleaning surfaces. Recommended blasting pressures, grit size, blasting angle and nozzle distance from work. Applications. Basic types of equipment. 12 pages. Norton Co. **431**

Miscellaneous

Welding handbook

Atom-Arc low-hydrogen electrodes with iron powder additive for low-alloy, high-tensile steels. Electrodes classed by American Welding Society requirements. Chemical and physical properties of weldments, applications to steels coded under ASTM designations. Also, steels listed by trade names with properties and recommended electrodes. 65 pages. Alloy Rods Co. **432**

Parts repair manual

Instructions and welding hints useful in repairing and rebuilding worn parts such as bucket teeth, grouser bars and crusher parts. 16 pages. American Brake Shoe. **433**

Welding supplies, methods

Full line of welding electrodes classified by American Welding Society's numbering system. Welders and accessories. Guide to welding methods for various metals. 40 pages. Lincoln Electric Co. **434**

Soil testing instrument

Michimho Vibroground measures earth resistivity for determining location and quantity of sub-surface material. Compilation of reprints on the method. Associated Research Inc. **435**

Concrete testers

Field plant and laboratory compression testers for concrete cubes, cylinders or blocks. Deluxe models also test beam strength. Capacities to 500,000 psi. Also, pipe testers and cylinder molds. Four pages. Forney's Inc. **436**

Dryer capacity calculator

Slide rule for asphalt plant owners. Tells percent of moisture removed from asphalt under various conditions and fuel oil or natural gas consumption required. Barber-Greene Co. **437**

Liquid flow chart

Measurement of liquid flow through 90 deg V-notch weirs can be graphically recorded on non-linear chart to be used with Stevens Type F. Recorders operating at English 1:1 ratio gage scale. Samples of chart No. F-8. Leupold & Stevens Instruments, Inc. **438**

Snap-on tube couplings

Selection guide for quick connect-disconnect tube couplings. Covers over 575 fluids and gasses. Tables of flow and pressure drop, seal swell, working pressures, force to connect and spillage on disconnect. Specs for manufacturer's line. 62 pages. Snap-Tite Inc. **439**

Tire inflator

Automatic tire inflator for trucks, construction equipment and automobiles fills tires to a preset pressure within a range of 5 to 110 lb and with an accuracy of ±1 lb. OPW-Jordan Corp. **440**

Large tire valves

Special large-bore tire valves for off-highway equipment. Valve bending tools, tire gages, inflating equipment and valve repair tools. A. Shrader's Son. **441**

Information Service Center

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Here's the easy way to get copies of manufacturers' publications, editorial reprints and more information about products and services advertised in ENR.

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Circle Key Number and Print Name on Coupon *Good until Nov. 15, 1961*

ADVERTISED PRODUCTS:						INSIDE FRONT COVER						INSIDE BACK COVER					BACK COVER		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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502. Houston: Where Growth Comes Naturally—A relentless building boom guided largely by private interests.

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503. Norfolk Makes a Bid for Prosperity—Imaginative use of federal aid in urban renewal helps set this old seaport for the future.

504. Reaching Out for Floor Space—Welded tees support cantilevered overhangs, providing greater floor area for a skyscraper.

505. Concrete Crosses Carry Building Loads—Decorative grillwork forms structural outer walls and replaces beam-and-column construction.

506. ENR's Top Contractor List—A record volume of heavy construction in 1960 sweeps 88 companies into the list of those with new business of $25 million or more.

507. The Money Makers (and Some Losers)—Annual reports of the publicly held constructors show that stiff competition reduced profit margins for most companies.

508. How to Figure Steel Weight in Bridges—A chart gives minimum weight in highway bridges as an aid to estimating dead loads and costs.

509. New Tool for Job Management—The diagramatic Critical Path Method which is replacing the bar graph for depicting construction schedules.

510. Building New Plants for New Products—The demand for new types of products spurs novel concepts in industrial building construction.

Attention to details...

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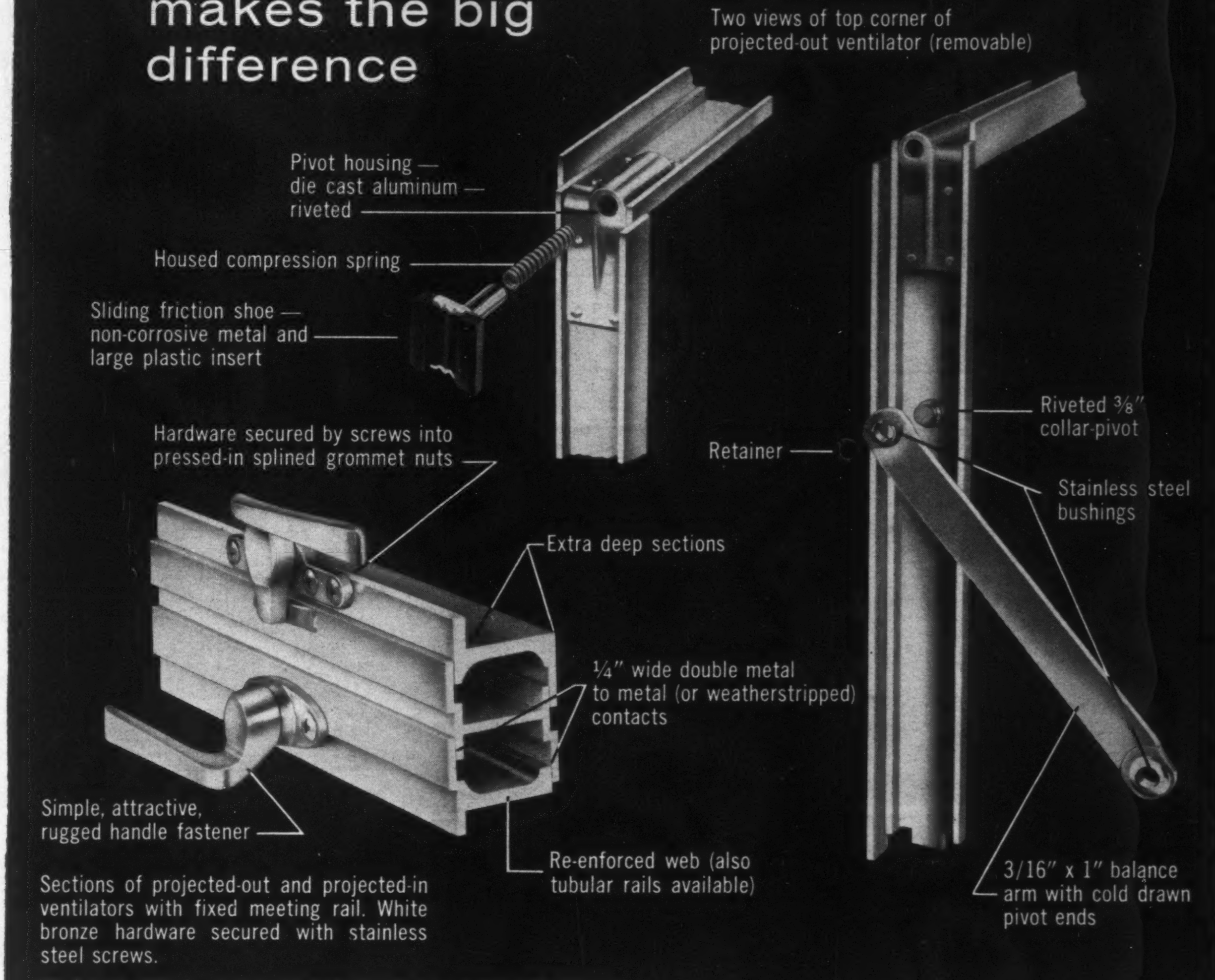
Two views of top corner of projected-out ventilator (removable)
Pivot housing — die cast aluminum — riveted
Housed compression spring
Sliding friction shoe — non-corrosive metal and large plastic insert
Hardware secured by screws into pressed-in splined grommet nuts
Extra deep sections
¼" wide double metal to metal (or weatherstripped) contacts
Simple, attractive, rugged handle fastener
Re-enforced web (also tubular rails available)
Retainer
Riveted ⅜" collar-pivot
Stainless steel bushings
3/16" x 1" balance arm with cold drawn pivot ends

Sections of projected-out and projected-in ventilators with fixed meeting rail. White bronze hardware secured with stainless steel screws.

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Construction Reports

Bids Asked—Low Bidders—Contracts Awarded—

NEW ENGLAND

HEAVY CONSTRUCTION—BA

† Mass., **North Attleboro**—BA 9/25—Regional Dir. Bureau Sport Fisheries & Wildlife, U. S. Fish & Wildlife Service, 59 Temple Pl., Boston 11, hot-mix, hot-laid b. conc. PAVT. at National Fish Hatchery, Inv. Bid No. SFW5-156.

† Mass., **East Boston** — BA 9/27 — Federal Aviation Agency, Federal Bldg., International Airport, Jamaica, N. Y., VISUAL GLIDE SLOPE INDICATOR SYS. RUNWAY 22L, IFB-1-62-51B1.

BUILDINGS—BA

Mass., **Springfield**—BA 9/29—American International College, 170 Wilbraham Rd., Proj. HHFA No. CH Mass-650, men's DORMITORY, Garden St. $400,000. Wallace E. Dibble, 1618 Main St., Springfield, archt. CD 2/5/59.

▲ Me., **Waterville** — BA 10/5 — City, Supt. Schools, Pleasant St., HIGH SCHOOL. $1,300,000. Bunker & Savage, 16 Winthrop St., Bangor, archts. Carroll E. Taylor, 410 Summer St., Auburn, struct. engr. CD 2/23/61.

▲ Mass., **Amherst**—BA 10/6—Commonwealth Mass., Dpt. Educ., Div. Bldg. Constr., 38 Chauncy St., Boston, U-59-4 Contr. 1, PHYSICS BLDG. ADDN., University of Massachusetts. $1,829,100. Plans deposit $100. Desmond & Lord, 6 Beacon St., Boston, archts. CD 2/2/59.

Conn., **Jewett City** — BA 10/24 — Town of Griswold, School Bldg. Com., Town Hall, 46,000 sq. ft. ELEMENTARY SCHOOL, Preston Rd. $790,000. Malmfeldt Assocs., 36 Pearl St., Hartford, archt. Chandler & Palmer, 16 Franklin St., Norwich, engrs. CD 10/27/60.

HEAVY CONSTRUCTION—LB & CA

MAINE—State Hy. Comn., Augusta, ROAD,
Thomas DiCenzo, Calais, Me., CA **$702,360**, (5 bidders), b. conc. road 6.887 mi. towns of Newcastle and Damariscotta, FAP Nos. F-026-1(21), Contr. 1 and F-026-1(23), Lincoln Co. BA 9/6. CD 8/21/61.

▲† **Franchi Constr. Co., Inc.**, 425 Watertown St., Newton, Mass., CA **$1,551,425**, COMPOSITE MEDICAL FACILITY, Dow Air Force Base, ENG-19-016-62-4, BANGOR, ME. U.S. Eng., 424 Trapelo Rd., Waltham, Mass. BA 8/22. CD 8/24/61, under LB.

VERMONT—State Dpt. Hys., State Admin. Bldg., Montpelier, ROADS,
Fabi & Sons, Ltd., 800 King St., East Sherbrooke, Que., Canada, CA **$898,007**, est. $957,132, concrete road work Rte. 91, Proj. 1-91-3(5), Derby. BA 9/1/61. CD 9/7/61, under LB.

VERMONT—State Hy. Dpt., State House, Montpelier, Bids opened 9/8, ROADS,
Miller Constr. Co., Ascutney Blvd., Windsor, Vt., and **Edwin R. Putnam**, Box 45, Bridgewater Corners, Vt., LB **$542,834**, est. $559,983 (12 bidders), highway and two bridges, U. S. Rte. 4, Proj. F-020-2(8), Bridgewater. CD 8/28/61.

▲ **RHODE ISLAND**—State RI & Prov. Plants, Div. Purchase, State House, Providence, ROAD,
Aetna Bridge Co., 12 Stukley St., Providence, R. I., CA **$4,686,335**, highway constr. and bridges, Fed. Aid Proj. No. 1-95, Bid 74, Contr. No. 6177, Providence, BA 8/9/61. CD 8/11/61, under LB.

Mariani Constr. Co., Inc., 222 Forbes Ave., New Haven, Conn., LB **$109,110**, (1 bidder), BRIDGE over Branford River on Pine Orchard Rd., BRANFORD, CONN. Town, Bd. Selectmen, 173 Montowese St., Branford, Conn. BA 9/6/61. CD 9/1/61.

BUILDINGS—LB & CA

Sciaba & Co., Inc., 86 Shawmut Ave., Boston, Mass., CA **$585,600**, est. $600,000, POLICE STATION, 350 Washington St., BROOKLINE, MASS. Town, Bldg. Comn., Town Hall, Brookline, Mass. Severud, Elstad, Krueger Assoc., 415 Lexington Ave., New York, N. Y., struct. engrs. BA 8/29. CD 9/5/61, under LB.

▲ **Jefferson Constr. Co.**, 75 First St., Cambridge, Mass., LB **$1,089,751**, HOUSING for the ELDERLY, three sites, SA Proj. Malden 667-3, MALDEN, MASS. City Housing Auth., 275 Newland St., Malden, Mass. BA 9/6. CD 8/11/61.

Jet Constr. Co., Rte. 62 near Rte. 1, Middleton, Mass., Owner Builds, **$450,000**, (1st section), 18 HOUSES, Danvers Plaza, Rte. 62, MIDDLETON, MASS.

▲ **Dudley Hill Realty Co., Inc.**, Alton Dr., Dudley, Mass., CA Est. **$1,000,000**, SHOPPING CENTER, Rte. 197 West Main St., WEBSTER, MASS. B. & B. Realty Corp., c/o Baker Realty, 3 Day St., Webster, Mass. Forrest Jones, RFD 1, Charleston, Mass., archt.

Nanni Bldg. Co., 1415 Atwood Ave., Johnston, R. I. LB **$644,250**, est. $700,000, (12 bidders), SCIENCE LABORATORY, Providence Rhode Island College, Mt. Pleasant Ave., Proj. No. 126, Proj. No. RIC 25, PROVIDENCE, R. I. State R. I. & Prov. Plants, Div. Purchase, State House, Providence, R. I. BA 9/8/61. CD 8/18/61.

▲ **Mauro Constr. Co., Inc.**, Totoket Rd., North Branford, Conn., LB **$2,760,000**, 3 story, 165-unit, eleven garden type APARTMENTS, Broad St. Redevelopment Area, Federal Housing Project, ANSONIA, CONN. Ansonia Housing Auth., 15 Maple St., Ansonia, Conn. BA 8/29/61. CD 8/1/61.

William A. Mauser, Jr. Constr. Co., 345 N. Main St., West Hartford, Conn., LB **$668,568**, (12 bidders) 1 story, brick ELEMENTARY SCHOOL, Coppermine Rd., FARMINGTON, CONN. Town, School Bldg. Comn., Town Hall, Unionville, Conn. BA 9/7/61. CD 8/14/61.

St. George Greek Orthodox Church, 182 Jefferson St., Hartford, Conn., cancelled bids to have been opened Sept. 5, steel frame, masonry walls, precast stone facing CHURCH, 433 Fairfield Ave., HARTFORD, CONN. Est. **$500,000.** CD 8/23/61.

▲ **Kay-Locke, Inc.**, 32 Allerton St., Boston, Mass., CA **$2,225,000**, 122,000 sq. ft. FOOD DISTRIBUTION CENTER, 17,500 sq. ft. OFFICE, NORTH HAVEN, CONN. Stop & Shop Inc., North Haven, Conn A. Epstein & Sons, Inc., 2001 Pershing Rd., Chicago, Ill., archt. CA 8/21/61.

Kay-Locke, Inc. of Connecticut, 32 Alerton St., Boston, Mass., CA **$516,000**, WAREHOUSE, Montowese Ave., NORTH HAVEN, CONN. Montowese Industrial Park, 393 D St., South Boston, Mass. CA 9/7/61.

William J. Lyons Constr. Co., Inc., 2 Wilton Ave., Norwalk, Conn., CA **$512,290**, Naramake ELEMENTARY SCHOOL, Strawberry Hill Ave., NORWALK, CONN. Town, City Clerk, City Hall, South Norwalk, Conn. BA 8/22/61, CA 9/8/61. CD 8/29/61, under LB.

▲ **L. Hickey, Inc.**, 13 Spring St., Stamford, Conn., LB **$2,179,890** (5 bidders), River JUNIOR HIGH SCHOOL, STAMFORD, CONN. Town, Purch. Agt., City Hall, Stamford, Conn. BA 9/7/61. CD 8/23/61.

▲ **Southern New England Contg. Co.**, 66 Sanford St., Hartford, Conn., CA **$1,574,700**, Proj. No. BI-2B-116, Motor Vehicle Dpt. OFFICE, WETHERSFIELD, CONN. State Pub. Wks. Comr., 165 Capitol Ave., Hartford, Conn. BA 8/16/61. CD 8/21/61, under LB.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

† N. Y., **Rosebank**—BA 9/25—General Service Admin., 250 Hudson St., New York Zone 13, wid'n. b. conc. ROADWAYS, constr. asphalt PARKING LOT and REPAIRING CONCRETE CURBS, SIDEWALKS, U.S. Quarantine Station, Proj. 00957.

New York—BA 9/26—Long Island State Park Comn., Admin. Headquarters, Belmont Lake State Park, Babylon, GOLF COURSE IRRIGATION SYSTEM, Sunken Meadow State Park, Kings Park.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $53,000; other public works $88,000; Industrial buildings $110,000; other buildings $400,000. Also Foreign projects of $1,000,000 and more in size of Interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED
New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK
Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.

BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.

SOON LETS CONTRACT: SLC

LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily Issue in which last previous report was published.

OWNERS, ENGINEERS, ARCHITECTS, CONTRACTORS are invited to report their new jobs for listing in these reports when they meet or exceed the size minimums shown above. Address these news releases to J. A. Mahoney, **REPORTS, ENGINEERING NEWS-RECORD**, 330 W. 42 St., **New York 36, N. Y.**

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Construction Daily

For additional reports see **Construction Daily.**

New York—BA 9/26—Long Island State Park Comn., Administration Headquarters, Belmont Lake State Park, Babylon, general constr. plumbing, heating and electrical work OFFICE and STORAGE SPACE, incl. outside utilities at Captree State Park, Suffolk Co.

Pa., **Phila.**—BA 9/26—Dpt. Procurement, City Hall Annex, Bid No. 2812-R2—resurf. conc. walkways of grit chamber and sludge storage tanks, NORTHEAST SEWAGE TREATMENT WORKS, Richmond St., and Wheatsheaf Lane; Bid No. 2813-R2—furnishing, installing addnl. 8 in. **cast iron supernatant return pipeline** to revise supernatant discharge from lagoons to settling tanks, area adjacent to sludge handling bldg., Southwest Sewage Treatment Works, Penrose Ave. and 80th St.; Bid No. 2851, furnishing, installing **parts** in **air filters**, all appurtenant work at Blower Bld., Northeast Sewage Treatment Works, Richmond St. and Wheatsheaf Lane, for Water Dpt. Plans deposit $20. CD 11/8/58.

New Jersey—BA 9/28—State Hy. Dpt., 1035 Parkway Ave., Trenton, UNDERGROUND STRUCTURES for traffic signal systems, various Intersections, N.J. highways, Contract 1. Plans deposit $1.

N. J., **Millburn**—BA 10/16—Twp. Millburn, Municipal Bldg., Contract 2, general contract and Contract 3, pool and recirculation and equipment for SWIMMING POOL, White Oak Ridge Park. CD 9/8/61, under LB.

New York and New Jersey—BA 10/19—Port of New York Auth., 111 Eighth Ave., New York 11, N. Y., Contr. AK-140.001, ROADWAY WID'N., Outerbridge Crossing. Plans deposit $50. Extended date. CD 8/10/61.

BUILDINGS—BA

▲ N. Y., **Brooklyn**—BA 9/26—Deputy Supt. Schools, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr., plumbing and drainage, heating and ventilating and electrical work and lighting fixtures PUBLIC SCHOOL 242 ADDN., Flatlands Ave. and E. 100 St., Brooklyn Boro. Plans deposit 25 general, $10 mechanical trades. Extended date. CD 8/29/61.

Pa., **Collegeville**—BA 9/26—Collegeville-Trappe Joint School Auth., Collegeville, HIGH SCHOOL ADDN., ALTERATIONS, $700,000. Plans deposit $50. Wolf & Hahn, 459 Hamilton St., Allentown, archts.

▲ Del., **Newark**—BA 9/27—Newark Bd. Educ., Newark, Christiana HIGH SCHOOL, $3,324,000. Martin & Wason, 830 West St., Wilmington archts. Chester Duncan, 225 S. 15th St., Phila., Pa. engr. Bids 8/30 rejected. CD 9/5/61, under LB.

N. J., **Pitman**—BA 9/28—Pitman Bd. Educ., Pitman, ELEMENTARY SCHOOL, West Woodland Ave. Over $400,000. Plans deposit $50. Norman W. Coates, Auten Rd., Somerville, N.J., archt. H.K. Elo, 711 Lehigh St., Easton, Pa., engr. CD 6/5/61.

▲ N. Y., **Brooklyn**—BA 9/28—Deputy Supt. Schools, Bureau Constr., 42-15 Crescent St., Long Island City, Zone 1, general constr., plumbing and drainage, heating and ventilating and electrical work and lighting fixtures PUBLIC SCHOOL 309, Ralph, Madison and Monroe Sts. Spec. Nos. 204, 205, 206 and 207 of 1960. Brooklyn Boro., $2,200,000. Plans deposit $25 general, $10 each mechanical trades. Extended date. CD 8/30/61.

▲ Del., **Wilmington** — BA 10/4 — Alfred I. DuPont School Dist., 1400 Foulk Rd., Forwood SCHOOL, $1,475,000. Plans deposit $40. Whiteside Moeckel & Carbonell, 9th and Market Sts., archts. Louis H. Doane, Front and French Sts. Phila., Pa. engrs. CD 9/11/61.

† N. Y., **Massena**—BA 10/6—General Services Admin., Business Service Center, 250 Hudson St., New York, Zone 13, U.S. POST OFFICE extension, moderization. Job Order No. 80,257. Extended date. CD 9/1/61.

▲ Pa., **Indiana**—BA 10/11—General State Authority, 18th and Herr Sts., Harrisburg, three DORMITORY BLDGS. Bldg. A, storage, utilities at ground level, recreation room, snack bar, apartment for dean, lounge, two study rooms, office, etc., Bldg. B, storage, utilities, recreation room, etc., Bldg. C, similar storage and utilities, recreation room, snack bar, etc., $2,590,000. Joseph Hoover, 333 Blvd. of the Allies, Pittsburgh, Zone 22, archt. CD 9/30/60.

N. J., **Princeton**—Bids Asked—Holiday Inns, Inc., c/o Harvey Gordon & Assoc., archts., 904 20th St., NW, Wash., D.C., (selected list of bidders) 104 units Holiday Inn MOTEL, incl. swimming pool, restaurant. Over $750,000. Bernard J. Shaw & Assocs., 37 Washington St., Morristown, struc. engrs. CD 7/14/61.

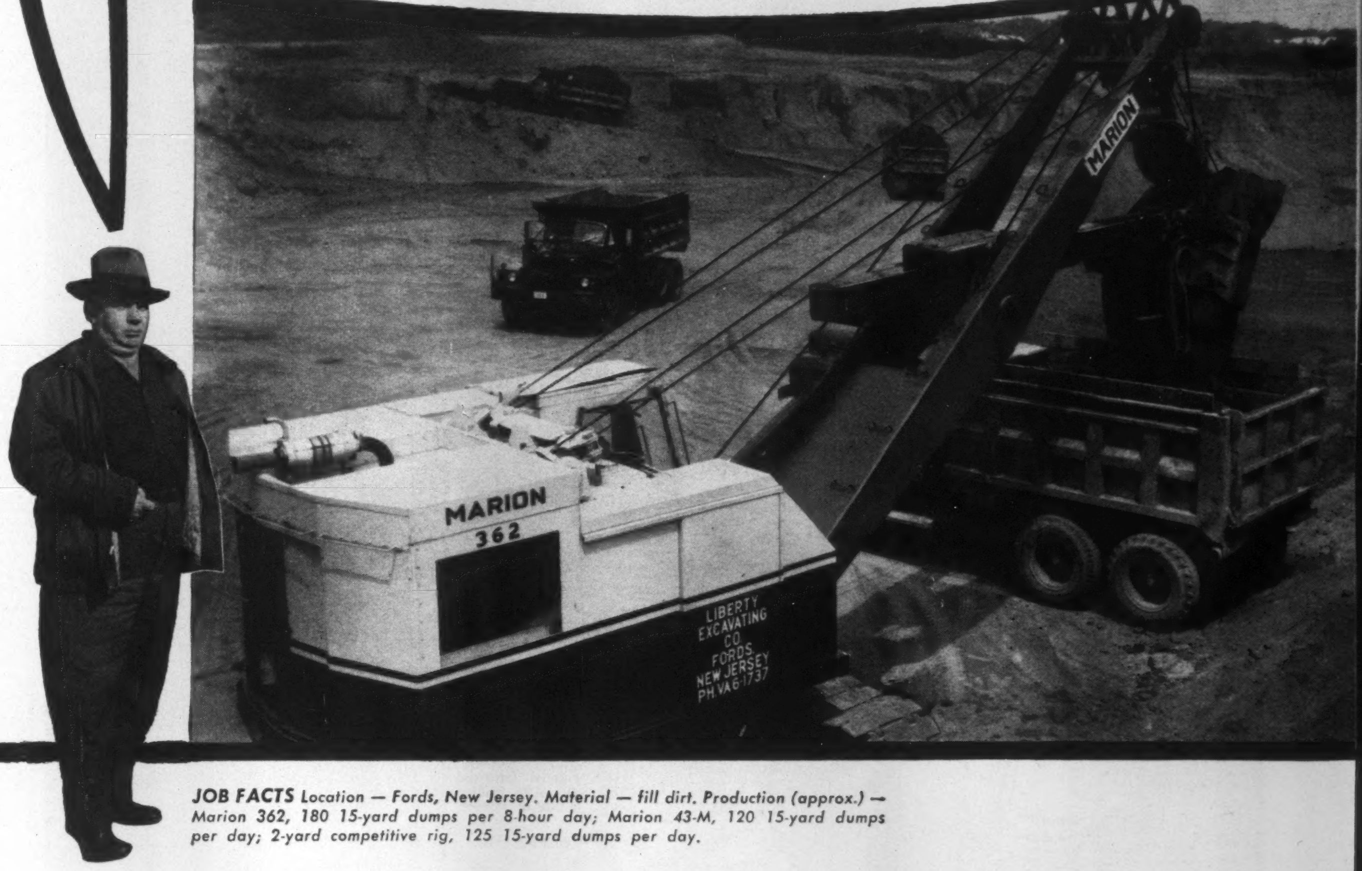
BUILDINGS—SLC

▲ N. Y., **Buffalo**—H. A. Kresse, Regional Real Estate Mgr., Rm. 5012, Main Post Office, New York 1, N. Y., soon lets contract build-lease Central POST OFFICE. $10,000,000-$15,000,000. James, Meadows & Howard, 250 Delaware Ave., Zone 2, archts. CD 7/20/61.

N. Y., **Jamaica**—Greek Orthodox Community, St. Demetrious Church of Jamaica, 152-01 84 Dr., soon lets contract, CHURCH, $800,000. William Chirgotis, 80 Morris Ave., Springfield, N.J., archt. A.D. Jilajian, 238 Main St., Hackensack, N.J. mech. engr. Gilbert Chevalier, 250 Fort Lee Rd., Leonia, N.J., struct. engr. CD 8/24/61.

(Continued on page 215)

"Our 1½-yard MARION will outload a competitive 2-yard rig by over 650 yards a day!"



JOB FACTS *Location — Fords, New Jersey. Material — fill dirt. Production (approx.) — Marion 362, 180 15-yard dumps per 8-hour day; Marion 43-M, 120 15-yard dumps per day; 2-yard competitive rig, 125 15-yard dumps per day.*

"That means, simply and profitably, 45 more 15-yard trucks leave the pit every day," continued Charles Ludwig, owner of Liberty Excavating Company in Fords, New Jersey. "And, it takes less fuel than the competitive machine . . . at least 10 gallons less fuel every day. The fuel isn't necessarily expensive, but the delay to refuel the other machine is."

Superintendent Charles Ludwig, Jr. on costs: "We've had no major downtime since the Marion 362 was purchased back in September, 1959. The Marionair control system helps too. With the controls on the two-yard unit requiring some ten minutes daily to adjust the linkage, the Marion can be loading five additional trucks."

Small wonder the field-proved 362 is one of the industry's great excavators. And, it keeps getting better. A dozen recent improvements including a new single-stick handle make this a shovel to compete with—not against. Interested? We've got more facts and figures for you that dramatically demonstrate why . . .

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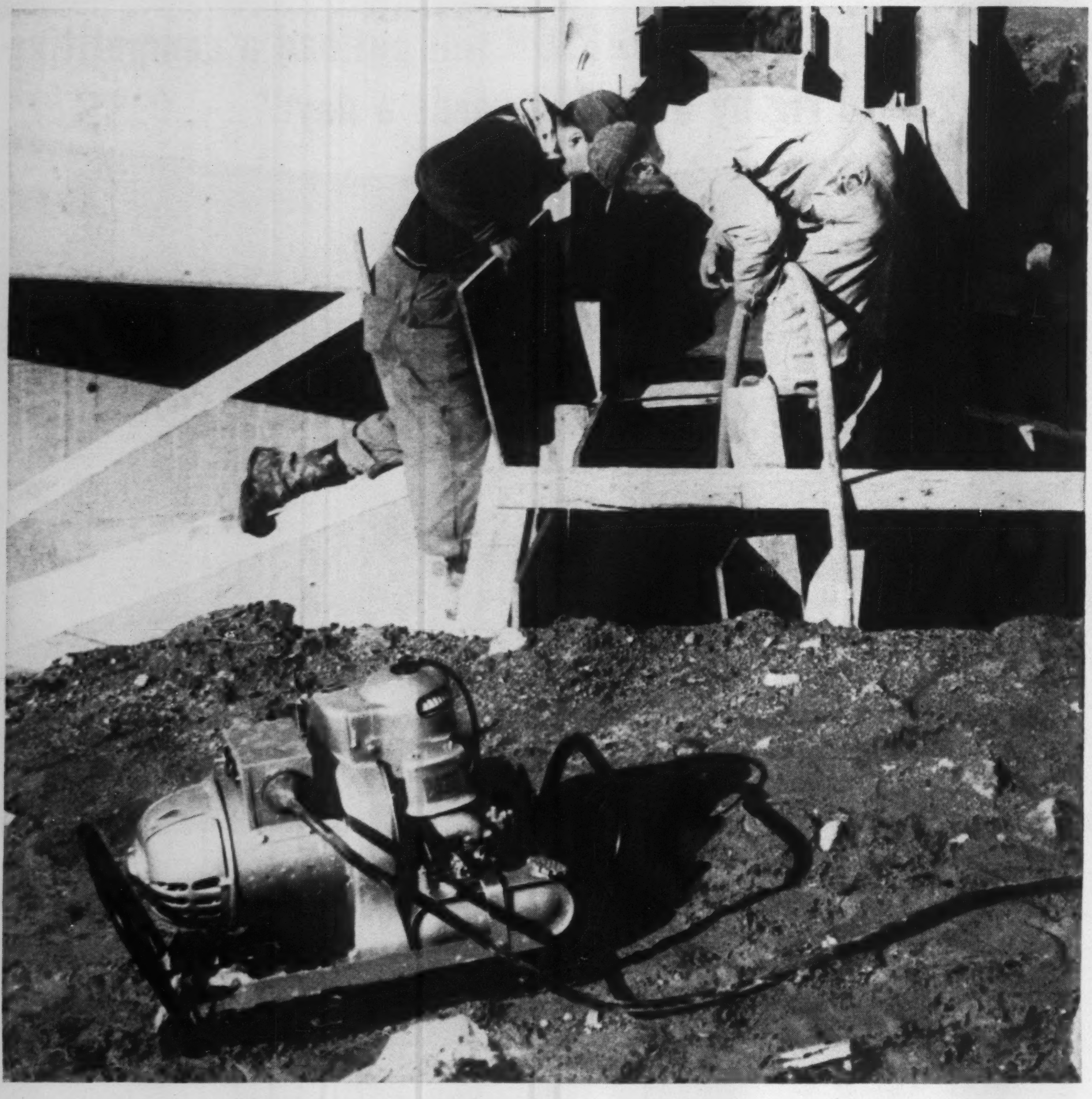

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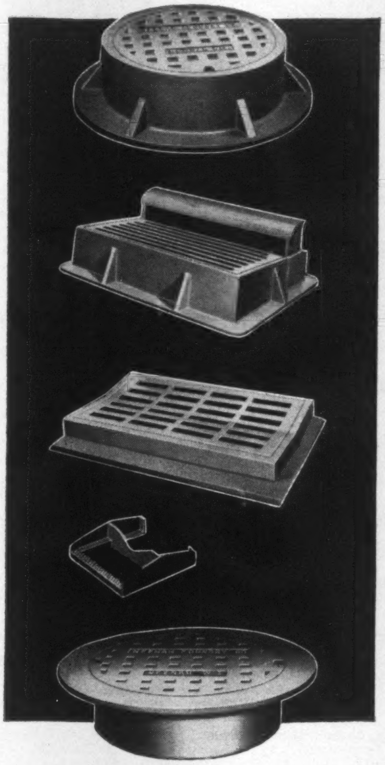

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CIRCLE 37 ON READER SERVICE CARD

(Continued from page 212)

HEAVY CONSTRUCTION—LB & CA

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROADS,

N. Y.—**Rocco Mancini**, Plumbrook Rd., Golden's Bridge, N. Y., CA **$682,965**, b. conc. 4.87 mi. rein.-con. open box br. 23.09 ft. span rein.-con. closed box br. 33 ft. span Stanfordville Bullshead-Wurtemburg Rd. C.R. 19 FASS 61-2, Proj. S-342(2), Dutchess Co., CA 8/30;

N. Y.—**Torrington Constr. Co., Inc.**, Box 336, 116 E. Main St., Torrington, N. Y., CA **$2,272,399**, b. conc. 11.56 mi., misc. work 0.2 mi. Stephentown-Lebanon Springs, SH 8279; Stephentown Ctr. Mass. SH 680; Stephentown-Center Berlin, SH 8163, Rte. 22, 43, FARC 61-104. Proj. F-440(3) 'F-257(5), Rensslaer Co. BA 7/27. CA 9/4. CD 7/28/61, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, ROAD,

D. W. Winkelman Co., Inc., 300 Long Branch Rd., Syracuse, N. Y., CA **$1,956,262**, 2.4 mi. Interstate Rte. 505 (Syracuse-Mattydale) SH 54-3 incl. interchange with New York State Thruway and 7 North St. C.R. 221), Int. Trg. Rte. 81, FIRC 61-128, Onondaga Co. BA 8/10. CA 9/4. CD 8/15/61, under LB.

▲ **NEW YORK**—State Dpt. P. Wks., State Office Bldg., Albany, BRIDGE,

Bethlehem Steel Co., Bethlehem, Pa., CA **$8,397,963**, superstructure 14 spans 6,870 ft. total 1.3 mi. Newburgh-Beacon Bridge over Hudson River, Contr. 3, NBB 61-2, Dutchess and Orange Counties. BA 7/27. CA 8/30. CD 7/28/61, under LB.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton, Bids opened 9/7, ROADS,

Joseph Lafferty & Sons, Inc., Green Tree Rd. and State Hy. 70, Medford, N. J., LB **$174,668**, (3 bidders), resurf. Rte. 70, Section 2A, from Rte. 41 to south branch Pennsauken Creek, Delaware Twp., Camden Co. CD 8/21/61.

▲ **H. L. Harrison & Son, Inc.**, Box 240, Westfield, N. J., LB **$1,209,000**, (5 bidders), Contr. 1, Old Bridge COLLECTION SYSTEM, OLD BRIDGE, N. J. Madison Twp. Sewerage Auth., P.O. Box 72, Laurence Harbor, N. J. BA 9/6/61. CD 8/8/61.

Chicago Bridge & Iron Co., 610 Center Plaza, Phila., Pa., CA **$235,950**, WATER TANK, Silvia St., Ewing Township, TRENTON, N. J. City, City Hall, Trenton, N. J. Lewis Klockner, Trenton, N. J., city engr. CD 10/23/59.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened Sept. 8, BRIDGES,

Pa.—**A. E. Oblock**—Unity, Pa., LB **$1,285,866**, six bridges, resurf. 7.22 mi. Traffic Rte. 144, bet. Renova and Galeton, Leidy and Stewartson Townships, Clinton Co.;

Pa.—**Allen & Calhoun General Contractors, Inc.**, 5223 Bryant St., Erie, Pa., LB **$261,622**, two bridges, over Steer Run and Big Mahoning Creek, West Mahoning Township, near North Point, Leg. Rtes. 32111-32143, Indiana Co.;

Pa.—**R. L. Hinaman & Max Persun, Inc.**, 1754 Hinaman Heights, Williamsport, Pa., LB **$489,967**, reconstr. three bridges to improve alignment and grades, 4.12 mi., Leg. Rte. 41028, Woodward and Anthony Townships, bet. Linden and Salladasburg, Lycoming Co.;

Pa.—**Kerbert Constr. Co.**, R.D. 6, Meadville, Pa., LB **$647,222**, six arches, 1 bridge over Mill Creek, James Run, Longs Run, Scholfields Run, Black Run, and branch of East Sandy Creek, widening, bit. surf. to improve grades and sight distances, 8.46 mi., bet. New Lebanon and Conneaut Lake Boro, Traffic Rte. 285, Mercer Co.;

Pa.—**Irving N. Loomis & Son**, Montrose, Pa., LB **$168,665**, three bridges over Horton Creek, Meshoppen Creek, and Silver Creek, bet. Nicholson, Kimock, Laurel Lake and Fisk Mill, Leg. Rtes. 57010-842, Susquehanna Co. CD 8/9/61.

PENNSYLVANIA — State Hy. Dpt., 506 North Office Bldg., Harrisburg, Bids opened Sept. 8, ROADS,

Pa.—**Arram Constr. Co.**, 426 S. Springfield Rd., Clifton Heights, Pa., LB **$237,827**, reconstr. to improve traffic conditions and increase safety conditions, 1.07 mi., Legislative Rte. 543, Radnor Township (Delaware) and Tredyffrin Township (Chester), Delaware and Chester Counties;

Pa.—**Ezra Stipp Constr. Co.**, Love Rd., Scranton, Pa., LB **$139,677**, divided hy., bit. surf., widen from 34 to 39 ft. variable on each side of an earth and conc. media 4 to 14 wide, Mulberry Street, Scranton, Leg. Rte. 35072, Lackawanna Co.;

Pa.—**Edward A. Daylor Co., Inc.**, P.O. Box 551, Coatesville, Pa., LB **$104,933**, resurf., 2.31 mi., bet. Oxford and West Grove, Traffic Rte. 1, Chester Co. CD 9/8/61.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 North Office Bldg., Harrisburg, ROAD,

Allegheny Contg. Co., Inc., 801 Bingham St., Pittsburgh, Zone 3, CA **$5,213,798**, 24,445 ft. separated RCC hy. 24 ft. wide each side earth median, 7 bridges, L.R. 1009(4) Interstate sect. Keystone Shortway, Brookville Bypass, Jefferson Co., BA 8/11/61. CD 8/16/61, under LB.

Lisbon Constr. Co., 2446 Reedie Dr., Wheaton, Md., LB **$178,156**, (4 bidders), WIDENING, PAVING "L" St. N.W. between Connecticut Ave. and 20th St., WASH., D. C. D. C. Govt., Dpt. Hys., 499 Pennsylvania Ave. N.W., Wash., D. C., BA 9/6/61. CD 8/18/61.

▲ **Mountain State Constr. Co.**, P.O. Box 296, Spring Hill, W. Va., CA **$1,045,768**, Unit No. 4, Fairfax-Loudoun Tunnel of Potomac INTERCEPTOR SEWER, Fairfax, Va., WASH., D. C. D. C. Govt. Dpt. Sanitary Engineering, 499 Pennsylvania Ave. N.W., Wash., D. C. BA 8/23/61. CD 8/25/61, under LB.

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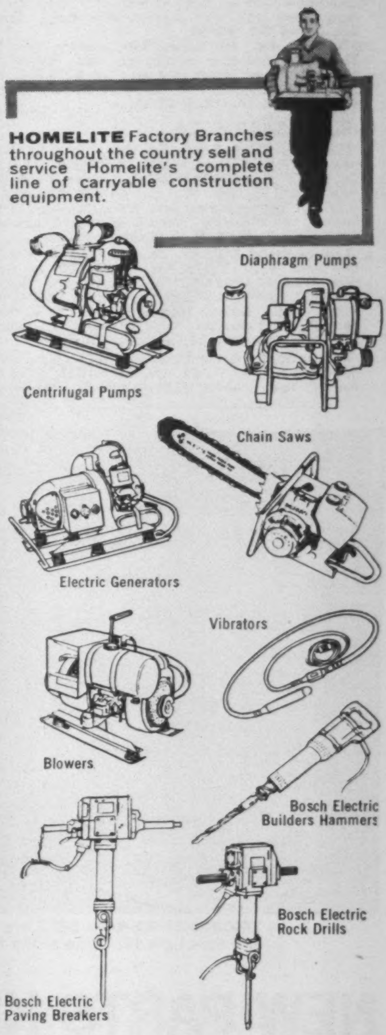
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DELAWARE—State Hy. Dpt., at office of Director Operations, Room 202, Hy. Administration Bldg., Dover, Bids opened 9/5, ROADS,

James Julian, Inc., 405 duPont Road, Elsmere, Del., LB **$206,102**, resurfacing existing hy. from Marydel to Pearson's Corner approx. 6.2 mi.; LB **$139,708**, resurfacing existing hy. from Hartly to Kenton, approx. 4.32 mi. Kent Co., CD 8/22/61.

BUILDINGS—LB & CA

▲ **Tishman Realty & Constr. Co., Inc.**, 666 Fifth Ave., New York 19, N. Y., CA Est. **$5,500,000**, 24 story St. James Towers APARTMENT, Lafayette and DeKalb Aves., St James Pl., Emerson Pl., BROOKLYN, N. Y. St. James Towers, Inc., Willoughby Walk, Inc., Sponsor, c/o contractor. Kelly & Gruzen, 10 Columbus Circle, New York 19, N. Y., archts.-engrs.

▲ **Tishman Realty & Constr. Co., Inc.**, 666 Fifth Ave., New York 19, N. Y., CA Est. **$5,500,000**, 24 story Pratt Towers APARTMENT, Lafayette and DeKalb Aves., St. James and Emerson Places, BROOKLYN, N. Y. Pratt Towers, Inc., Willoughby Walk, Inc., Sponsor, c/o contractor. Kelly & Gruzen, 10 Columbus Circle, New York 19, N. Y., archts.-engrs.

▲ **Tishman Realty & Constr. Co., Inc.**, 666 Fifth Ave., New York 19, N. Y., CA Est. **$5,500,000**, 24 story Ryerson Towers APARTMENT, Lafayette and DeKalb Aves., St. James and Emerson Places. BROOKLYN, N. Y. Ryerson Towers, Inc., Willoughby Walk, Inc., Sponsors, c/o contractor. Kelly & Gruzen, 10 Columbus Circle, New York 19, N. Y., archts.-engrs.

▲ **Hemlock Homes, Inc.**, c/o Paul & Jarmul, archts., 59 E. 54 St., New York 22, N. Y., Owner Builds, **$2,500,000**, 9 story Birchwood House APARTMENTS, 73 St. north of 37 Rd., JACKSON HEIGHTS, N. Y. Abrahams, Hertzberg & Cantor, 207 E. 37 St., New York 16, N. Y., struct. engrs. Chas. Wurmfeld, 150 Nassau St., New York 38, N. Y., mech. engr.

Fletcher-McCarthy Constr. Co., 3 Lower Patterson St., Ogdensburg, N. Y., CA **$622,952**, general contract HOSPITAL ADDN., LOWVILLE, N. Y. Bd. Managers Lewis Co. General Hospital, Lowville, N. Y. BA 8/3. CD 8/8/61, under LB.

▲ **Leon DeMatteis Constr. Co.**, 820 Elmont Rd., Elmont, N. Y., CA Est. **$3,000,000**, one 19 story Lind-Ric APARTMENT, northeast corner Waring and Barker Aves., Bronx Boro, NEW YORK, N. Y. Lind-Ric Apartments, Frederick DeMatteis. Sponsor, 820 Elmont Rd., Elmont, N. Y. Eggers & Higgins, 100 E. 42 St., New York 17, N. Y., archts. Abrahams, Hertzberg & Cantor, 207 E. 37 St., New York 16, N. Y., struct. engrs. Tizian Assocs., 567 Summer St., Stamford, Conn., mech. engrs.

▲ **Rose Assocs.**, 529 Fifth Ave., New York 17, N. Y., CA Est. **$5,900,000**, two 18 story APARTMENTS, Burckner Blvd., Colgate, Story and Wheeler, Bronx Boro, NEW YORK, N. Y. Evergreen Gardens, Inc., 529 Fifth Ave., New York 17, N. Y. Pomerance & Breines, 630 Third Ave., New York 17, N. Y., archts. Lev Zetlin, 114 E. 32 St., New York 16, N. Y., struct. engr. Sidney Barbanel, 29-46 Northern Blvd., Long Island City 1, N. Y., mech. engr.

▲ **Vermilya-Brown Co., Inc.**, 100 E. 42 St., New York 17, N. Y., CA Est. **$3,400,000**, 15 story, 170 unit Cannon Heights APARTMENT, Cannon Pl. and Ft. Independence St. south of W. 238 St., Bronx Boro, NEW YORK, N. Y. Cannon Heights, Inc., Sponsors: Bernard Ettinger, 31 Pinewood Rd., Roslyn, N. Y. and Roy Miller, Windmill Farm, Armonk, N. Y. Lama Proskauer & Prober, 395 Pearl St., Brooklyn 1, N. Y., archts.

R. J. Constr. Co., State Hy. 35 and Allenhurst Ave., West Deal, N. J., LB **$798,000**, (13 bidders), general contract ELEMENTARY SCHOOL, WESTBURY, N. Y. Bd. Educ. Union Free School Dist. No. 1, Westbury, N. Y. BA 9/7. CD 8/28/61.

Massett Bldg. Co., 212 North Georgia Ave., Atlantic City, N. J., LB **$748,460**, (4 bidders), general contract 1 story MUNICIPAL GARAGE and WORKSHOP, ATLANTIC CITY, N. J. City, City Hall, Atlantic City, N. J. BA 9/7/61. CD 8/25/61.

▲ **Mahony Troast Constr. Co.**, 790 Bloomfield Ave., Clifton, N. J., CA **$1,000,000**, 1 story, 171,000 sq. ft. WAREHOUSE, BRIDGETON, N. J. Owens Illinois Glass Co., Illinois Bldg., Toledo, O. R. N. Sheley Co., 3410 Cheltenham Rd., Toledo, O., archt.

T. V. Leo & Sons, 17 James St., Bloomfield, N. J., Owner Builds, **$400,000**, 30-unit APARTMENT, South Munn Ave., EAST ORANGE, N. J. Henry Boyer, 900 Broad St., Newark, N. J., archt.

Russo Constr. Co., 528 Grove St., Ridgewood, N. J., Owner Builds, **$400,000**, APARTMENT, Rtes. 4 and 208, FAIR LAWN, N. J.

A. S. B. Realty Co., 45 Harding Dr., South Orange, N. J., Owner Builds, **$450,000**, HOUSES, Emma Pl., LINDEN, N. J. Wm. Chirgotis, 80 Morris Ave., Springfield, N. J., archt.

S. Levy Co., Broadway and Everett Sts., Camden, N. J., LB **$598,833**, est. $1,041,703, JUNIOR SENIOR HIGH SCHOOL, SEWELL, N. J. Washington Twp. Bd. Educ., Sewell, N. J. BA 8/29/61. CD 8/9/61.

▲ **North Branch Development Co.**, U. S. Hy. 22, Dunellen, N. J., Owner Builds, **$1,000,000**, 50 HOUSES, Readington Rd., WHITE HOUSE, N. J. Silberstein & Silberstein, 24 William St., Newark, N. J., archts.

Flat Rock Constr. Co., Inc., 1531 Flat Rock Rd., Penn Valley, Pa., Owner Builds, **$400,000**, RESIDENTIAL DEVELOPMENT, Flat Rock Rd., etc., BALA CYNWYD, PA. Henry S. Berg, 141L Walnut St., Phila., Pa., archt.

Powell Evans Corp., 1416 Bywood Ave., Upper Darby, Pa., CA Over **$400,000**, 19 RESIDENTIAL DEVELOPMENTS, Brookmore Rd., BERWYN, PA. Parkside Corp., 1416 Bywood Ave., Upper Darby, Pa.

Robert McElroy, Valley Forge, Pa., Owner Builds, **$400,000**, RESIDENTIAL DEVELOPMENT, Rittenhouse Lane, etc., BERWYN, PA.

David M. Hunt Constr. Co., 117 S. 17th St., Phila., Pa., CA **$837,000**, COUNTY CLUB, GOLF COURSE, SWIMMING POOL, BLUE BELL, PA. Cedarbrook County Club, Cheltenham Ave., Phila., Pa. Carroll Grisdale & Van Alen, 6 Penn Center Bldg., Phila., Pa., archts. Hagy Docherty Assocs., 6 Penn Center Bldg., Phila., Pa., engrs. CD 1/27/61.

▲ **Chippin Hopman Assocs.**, Benson West Apartments, Jenkintown, Pa., Owner Builds, **$1,500,000**, 68 RESIDENTIAL DEVELOPMENTS, Oak Lane Rd., ELKINS PARK, PA. Henry S. Berg, 1411 Walnut St., Phila., Pa., archt.

Volda Co., Inc., c/o Anthony Volpe, King of Prussia, Pa., Owner Builds, **$600,000**, RESIDENTIAL DEVELOPMENTS (30), KING OF PRUSSIA, PA.

▲† **Dist. Pub. Wks. Officer**, 4th Naval Dist., Bldg. 1, U. S. Naval Base, Phila., Pa., cancelled bids to have been opened Sept. 8, 400 units CAPEHART HOUSING, 20th and Paterson Sts., Naval Base, NBy-CH-30891, PHILA., PA. **$6,400,000**. CD 8/8/61.

Eldon Constr. Co., 733 Kerper St., Phila., Pa., CA **$400,000**, 51 units, APARTMENT, Tyson Ave., PHILA., PA. Ray Richman, 7108 Castor Ave., Phila., Pa. S. Sherman Rocklis, 1315 Walnut St., Phila., Pa., archt.

Samuel Himelfarb & Sons, 1201 Princton Ave., Phila., Pa., Owner Builds, **$500,000**, 57 units, APARTMENT, 70th Ave., PHILA., PA.

Vance Judson Corp., 2901 Cheltenham Ave., Phila., Pa., Owner Builds, Over **$400,000**, RESIDENTIAL DEVELOPMENT, Primrose St., etc., PHILA., Pa.

Frank H. Wilson Co., 125 Coulter Ave., Ardmore, Pa., CA **$448,780**, est. $599,276, Sartain ELEMENTARY SCHOOL, PHILA., PA. Phila. Bd. Educ., 21st and Parkway, Phila., Pa. Livingston & Suer, 117 S. 17th St., Phila., Pa., archts. Charles O. Muschek, 1616 Walnut St., Phila., Pa., engr. CD 5/20/60.

Fox Built Homes, Inc., Plymouth Meeting, Pa., Owner Builds, **$400,000**, RESIDENTIAL DEVELOPMENT, Butler Pike, PLYMOUTH MEETING, PA.

▲ **Frank A. D'Lauro Co.**, 218 Willow Grove Ave., Phila., Pa., LB **$1,000,000**, St. Mary's HALL, CHURCH and GYM, VILLANOVA, PA. Augustinian Fathers, Vaillanova, Pa. BA 8/31/61. CD 8/29/61.

Barclay White & Co., 3337 Market St., Phila., Pa., CA Over **$400,000**, PHARMACEUTICAL PLANT, WEST

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P-299

POINT, PA. Merck Sharp & Dohme, West Point, Pa. Robert Montgomery Brown, 1729 Spruce St., Phila., Pa., archt.

▲† **Arthur Venneri Co.,** 1906 K St. N.W., Wash., D. C., CA **$2,475,900,** SATELLITE BLDG. NO. 8, Goddard Space Flight Center, GREENBELT, MD. National Aeronautics & Space Admin., Goddard Space Flight Center, Greenbelt, Md. BA 8/16. CD 8/18/61, under LB.

Hill & Kimmel, Inc., 1130 Wayne Ave., Silver Spring, Md., CA **$556,828,** Bladensburg JUNIOR HIGH SCHOOL ADDN., Blandensburg, MARLBORO, MD. Prince Georges Co. Bd. Educ., Marlboro, Md. BA 8/30. CD 9/6/61, under LB.

▲† **Skinker & Garrett,** 2607 Connecticut Ave. N.W., Wash., D. C., CA **$1,315,000,** HEADQUARTERS ADMINISTRATION BLDG. for National Arboretum, Dpt. Agriculture, WASH., D. C. General Services Admin., 7th and D Sts. S.W., Wash., D. C. BA 8/8/61. CD 8/10/61, under LB.

▲ **He-Hi Developers, Inc.,** New Castle, Del., Owner Builds, **$2,360,000,** RESIDENTIAL DEVELOPMENT (50), Rose Lane, NEW CASTLE, DEL.

Aims, Inc., 4025 New Castle Ave., New Castle, Del., CA **$750,000,** 72 units, MOTEL and RESTAURANT, Greater Wilmington Airport, NEW CASTLE, DEL. Newland Corp., c/o contractor. Warren R. Lewis & Assocs., Bellefonte, Wilmington, Del., archts.

SOUTH

HEAVY CONSTRUCTION—BA

Fla., West Palm Beach—BA 9/27—City, City Hall, Phases 2, 3, and 4 ATHLETIC STADIUM, $350,000. Plans deposit $100. R. H. Plockelman, 230 S. County Rd., Palm Beach, archt. CD 5/12/61.

† **West Virginia**—BA 9/27—U. S. Eng., 237 4th Ave., Huntington, installing SANITARY SEWER, Marmet Locks and DAM, Kanawha River, CIVENG-46-022-62-14. CD 9/15/59.

South Carolina—BA 10/3—Horry Telephone Cooperative, Inc., Conway, 1717 mi. TELEPHONE LINES, and 16 mi. IMPRVS. ON EXISTING LINES, Horry Co. $200,000. Plans deposit $10. McCall-Thomas Engineering Co., 941 Broughton St. S.E., Orangeburg, engrs. CD 6/20/61.

† **Kentucky**—BA 10/5—Obion Creek Watershed Conservancy Dist., Clinton Bank Bldg., Clinton, six EARTHFILL SEDIMENT RETENTION STRUCTURES Obion Creek Watershed, Site 35 approx. 4 mi. northwest; Site 37, approx. 8.5 mi. north; Site 39, approx. 7 mi. north; Site 41, approx. 4.5 mi. north; Site 42, approx. 3 mi. southwest and Site 2 approx. 11.5 mi. northwest of Community of Wingo, Graves Co. Inv. No. 1-OB-62. CD 9/18/58.

Tenn., La Follette—BA 10/10—City, City Hall, SECONDARY SEWAGE PLANT, LINES, LIFT STATIONS, $750,000. Plans deposit $85. Zimmerman, Evans & Leopold, Daniel Village, Augusta, Ga., engrs. CD 5/11/61.

† **South Carolina**—BA On Or About 10/12—U. S. Eng., P.O. Box 905, Charleston, DREDGING approx. 1,782,000 cu. yd. of material from Charleston Harbor, to net depths of 35-34-38 and 40 ft. m.l.w., 271,000 cu. yd. from Shipyard River to net depth of 30 ft. at m.l.w. and approx. 382,000 cu. yd. from U. S. Naval Ammunition Channel, to a net depth of 38 ft. m.l.w., dikes, spillways, and drains repairs, ENG-38-081-62-02.

BUILDINGS—BA

N. C., Charlotte—BA 9/26—Mecklenburg Co. Bd. Educ., 720 E. 4th St., Paw Creek JUNIOR HIGH SCHOOL, $600,000. Plans deposit $50. Malcolm & Higgins, 1310 Berkley Ave., archts. CD 9/8/61, under LB.

Ky., Springfield—BA 9/27—City, City Hall, HIGH SCHOOL and GYMNASIUM. Over $400,000. Thos. J. Nolan & Sons, 2300 Meadow Dr., Louisville, Zone 18, archts.-engrs. CD 7/13/61, under LB.

Fla., Leesburg—BA 9/28—City, City Hall, Leesburg General HOSPITAL. $500,000. Plans deposit $53. Reynolds, Smith & Hills, 4019 Blvd. Center Dd., Jacksonville, archts.-engrs. CD 11/23/59.

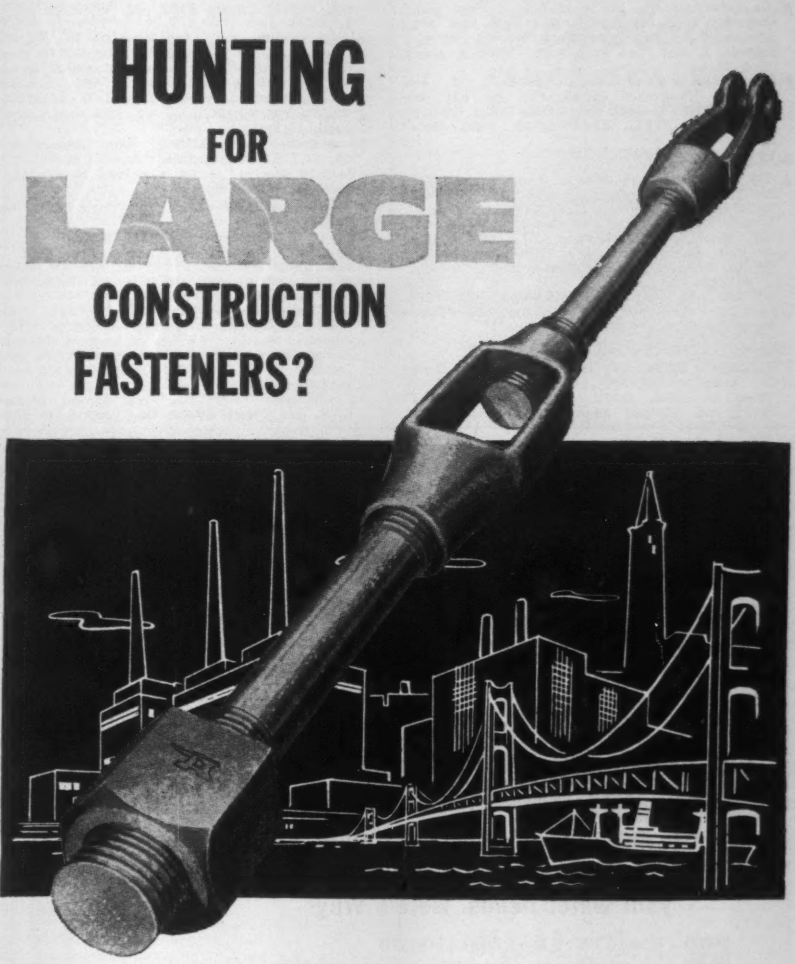
▲ **N. C., Raleigh**—BA 9/29—Corning Glass Works, Walnut St., Corning, N. Y., 120,000 sq. ft. MFG. PLANT, $1,000,000. Day & Zimmerman, Inc., 1700 Sansom St., Phila., Pa., archt. CD 9/22/61.

▲ **Fla., Miami**—BA 10/3—Barry College, 11300 NE 2nd Ave., WOMEN'S DORMITORY and STUDENT UNION BLDG., Miami Shores, Plans deposit $9. Barry & Key, 53 W. Jackson Blvd., Chicago, Ill. archts. CD 4/27/61.

Fla., Winter Park—BA 10/3—Rollins College, Holt Ave., MEN'S DORMITORY. Over $500,000. James Gamble Rogers, Lovelock & Fritz, Winter Park, archt. CD 1/12/61.

N. C., Raleigh—BA 10/3—City, Bd. Educ., 601 Devereux, HIGH SCHOOL. Plans deposit $75. Charles W. Davis, Jr., 701 W. Johnson, archt. CD 9/8/61.

▲ **Ky., Morehead**—BA 10/5—Commonwealth Ky., Div. Purchases, Frankfort, Proj. S-913-B women's DORMITORY No. 1, Morehead State College, Over $1,000,000, Plans deposit $25, McLoney, Tune & Clark, 628 East Main St., Lexington, archts., Staggs & Fisher, 317 S. Ashland Ave., Lexington, engrs.; Proj. S-913-A, rein.-con., brick men's DORMITORY No. 3, Approx. $1,000,000, Plans deposit $25, Sweet & Judd, Republic Bldg., Louisville 2, Ky., archts. E. R. Ronald & Assocs., 554 S. 3 St., Louisville 2, Ky., engrs. CD 2/20/61.



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▲ **Ga., Jonesboro**—BA 10/10—Clayton Co. Bd. Educ., McDonough St., 125,000 sq. ft. Forest Park HIGH SCHOOL, Forest Park. $1,200,000. Plans deposit $25. Bothwell & Nash, 206 Roswell St., Marietta, archts. CD 8/14/61.

† **Miss., Vicksburg**—BA About 10/18—U. S. Eng. Waterways Experiment Station, P.O. Box 631, fireproof OFFICE to incl. four major units interconnected, IFB CIVENG 22-079-62-4B. Plans deposit $10.

BUILDINGS—SLC

▲ **Fla., St. Petersburg**—Florida Presbyterian College, Box 387 soon lets contract, Dendy-McNair TEACHING AUDITORIUM and HUMANITIES CLASSROOM BLDG. Connell, Pierce, Garland & Friedman, 315 N.W. 27th Ave., Miami, archts. Perkins & Willis, 309 W. Jackson Blvd., Chicago, Ill., and J. F. Hamilton, 114 N.E. 7th St., Gainesville, assoc. archts. CD 8/17/61.

Ga., Atlanta—300 Peachtree Corp., 340 Boulevard, NE, soon lets contract 100 units APARTMENT BLDG. $750,000. Cunningham & Forehand, 1764 Chesire Bridge Rd., NE, archts. CD 8/21/61.

HEAVY CONSTRUCTION—LB & CA

† **McDonough Constr. Co. of Georgia**, 1958 Monroe Dr., N.E., Atlanta, Ga., LB **$253,700**, MODIFICATIONS to BLDG. 1247B, Proj. L-1809, LANGLEY FIELD, VA. National Aeronautics & Space Admin., Bldg. 1195, Langley Field, Va. BA 8/30/61. CD 8/1/61.

Atlantic Bitulithic Co., 1400 Roseneath Rd., Richmond, Zone 30, Va., LB **$102,866**, RESURF. NORTH BOULEVARD from Cary to Broad and Moore to Westwood Ave., RICHMOND, VA City Dpt. P. Wks., 217 Governor St., Richmond, Va. BA 8/23/61. CD 8/18/61.

▲ **NORTH CAROLINA**—State Hy. Comn. Capitol Bldg., Raleigh, BRIDGE,

Wilson Constr. Co., S. Main St. Ext., Salisbury, N. C., CA **$1,718,819**, structures, Proj. 8.16316, I 83-1(13)10, Gaston Co. BA 8/22/61, CA 9/6/61. CD 8/25/61, under LB.

▲ **NORTH CAROLINA**—State Hy. Comn., Capitol Bldg., Raleigh, ROADS,

N.C.—**C. G. Tate Constr. Co.**, 156 N. Union St., Concord, N.C., CA **$914,983**, fine grading, CABC, bit. conc. binder and surf. 10.275 mi. surf. on relocation of U.S. 64 between Nashville and Rocky Mount, Proj. 8.11639, F 67(10) Nash Co.;

N.C.—**Clement Brothers Co., Inc.**, Box 45A, Hickory, N.C. CA **$1,348,291**, grading, structures 8.12 mi Interstate Rt. 85, By Pass of Gastonia, from point approx. 2 mi. east of Kings Mt., northeast around Gastonia to US Rte. 321, Proj. 8/16318, I 85-1(13)10, Gaston Co.;

N.C.—**Ballenger Paving Co.**, Paris Station, Greenville, S. C. and **Propst Constr. Co.**, Concord, N. C., CA **$981,368**, fine grading, CABC, concrete pavement 3.93 mi. surf. Raleigh Belt Line between US 1 southwest of Raleigh northeast to US 70, Proj. 8.14907 SF 637(11) Wake Co. Grand total $3,244,642, BA 8/22/61, CA 9/6/61. CD 8/25/61, under LB.

Wachovia Bldg. Corp., 701 Georgetown Rd., Raleigh, N. C., Owner Builds, **$180,000**, RECREATION PARK, North Hills, RALEIGH, N. C. CA 6/7/60, under Commercial Bldgs.

▲ **SOUTH CAROLINA**—State Hy. Dpt., Hotel Columbia, Columbia. Bids opened Aug. 15, ROADS,

S.C.—**Robert E. Lee & Co., Inc.**, P.O. Box 417, Manning, S. C., LB **$99,845**, (5 bidders), grading, bit. surf., 7,871 mi. Rds. S-596, S-597, S-53, S. C. Docket No. 21,477; LB **$238,685**, (5 bidders), grading, bit. surf. 21.622 mi., Rds. S-257, S-260, S-76, S-79, S-263, S-104, S-50, S-25, S-262, S-222, S-242, S-258, S-245, S-132, S-192, S-270, S-237, S-271, S-272, S-138, S-209, S-254, S-246, S-277, S-278, S-424, S-280, S-196, S-138, S-283, U.S. Rte. 301 Connection, S. C. Dockets Nos. 14.352, and 14.353, F.A. Proj. Nos. S-1724(1), S-1725(1), S-669(2), S-667(3), S-1726(1), and S-756(2), Clarendon Co.;

S.C.—**Blythe Bros.**, 2911 N. Graham St., Charlotte, N. C., LB **$854,924**, (6 bidders), grading, macadam base course, b. conc. surf., constr. conc. curb, gutter, U.S. Rte. 321, S. C. Docket No. 46.471, Parts 1 and 2, F.A. Proj. No. F-78(6), York Co.;

S.C.—**Structures, Inc.**, Paris Station, Greenville, S. C., and **Highway Surfacing Co.**, Paris Station, Greenville, S. C., LB **$253,937**, (7 bidders), grading, bit. surf., Rds. S-535, S-404, S-405, S-1194, S-407, S-389, S-403, S-406, S-391, S-409, S-410, S-372, S-373, S-393, S-400, S-76, S-399, S-100, S-376, S-377, S-311, S-387, S-388, and S-425, S. D. Dockets Nos. 28.378 and 40.535, F.A. Proj. Nos. S-1728(1), S-1729(1), S-1730(1), Kershaw and Ricland Counties;

S.D.—**Dowd Constr. Co., Inc.**, Johnston, S. C., LB **$217,581**, (4 bidders), grading, bit. surf., 11.454 mi. State Rte. 186, Roads—S-156, S-236, S-22, S-107, S-145, S-73, S-233, S-234, and S-235, S. C. Docket Nos. 39.389 and 39.390, F.A. Proj. Nos. S-201(4), S-1734(1), S-1735(1), and S-1736(1), Pickens Co.;

S.C.—**Ballenger Paving Co., Inc.**, Paris Station, Greenville, S. C., LB **$327,954**, (4 bidders), grading, stab. earth base course (asphalt) b. conc. surf., constr. conc. curb, and gutter, 2.934 mi., State Rte. 73, S. C. Docket No. 26.394, Parts land 2, F.A. Proj. Nos. US-1266(2), and S-1266(3), Horry Co.;

S.C.—**U. S. Steel Corp.**, 71 Broadway, (Cyclone Fence Dpt.) New York, N.Y. LB **$241,599**, (6 bidders), erection of guard rail, fences, barrier post, 39.016 mi. S. C. Dockets Nos. 11.378 and 42.548, F.A. Proj. Nos. I-85-3(22) and I-585-3(230), Cherokee and Spartanburg Counties;

SC.—**Davis Mornage Constr. Co.**, 301 Gadsden St., Columbia, S. C., LB **$131,969**, (6 bidders), grading, bit. surf., 10.21 mi. Rds. S-96, S-80, S-228, S-116, S-228, S-116, S-81, S-232, S-224, S-225, and State Rte. 81, S. C. Docket Nos. 1.321 and 1.322, F.A. Proj. Nos. S-1713(1), and S-346(4), Abbeville Co.;

S. C.—**Banks Constr. Co., Inc.**, 2013 Reynolds Ave., Box 4420, Charleston Heights, S. C., LB **$166 471**, (6 bidders), grading, bit. surf. 7.493 mi., Rds. S-1075, S-1076, S-1081, S-567, S-1079, S-1077, S-200, S-212, S-1052, S-1053, S-216, S-1055, S-349, S-1057, S-1058, S-1059, S-1060, S-1062 thru S-1068, and S-1070 thru S-1074, S. C. Docket No. 10.498, Charleston Co.;

S. C.—**J. F. Cleckley & Co.**, P.O. Box 656, Orangeburg, S. C., LB **$166,168**, (8 bidders), resurf. with hot laid b. conc., surf. course, Type 2, 47.95 mi., Rds. 64, 81, 82, 341, 179, 73, 62, 194, 196, 236, 42, 237, 238, 239, 240, 53, 154, 79, 155, 175, 124, 61, 125, 88, 106, 100, 220, 26, 170, 171, 172, 173, 174, 88, 156, 95, 96, 151, 75, 77, 76, 126, 157, 127, 128, 66, 159, 65, 135, 67, 129 and State Rte. 381, State Rtes. 9 and 28, S. C. Docket No. 35.1030, U.S. Route 15, State Rte. 383 and 79, Rd. 47, Marlboro Co.

▲ **Panama-Willliams Corp.**, Melrose Bldg., Houston, Tex., CA Est. **$3,000,000**, NATURAL GAS TRANSMISSION LINE from Aiken to Camden, SOUTH CAROLINA. Carolina Pipeline Co., Beltline Blvd., Columbia, S. C. CD 7/23/59.

† **Palmetto Constr. Co.**, 2728 Spruill Ave., Charleston Heights, S. C., LB **$182,720**, SITE CLEARANCE and VARIOUS BLDGS. ALTERATIONS, Charleston Naval Shipyard, NBy-37372, Spec. 37372/61, CHARLESTON, S. C. Director, Southeast Division, Bureau Yards & Docks, Bldg. 13, Naval Base, Charleston, S. C. BA 9/6/61. CD 8/15/61.

GEORGIA—State Hy. Dpt., No. 2 Capitol Square, Atlanta, Zone 3, Bids opened 8/31, ROADS,

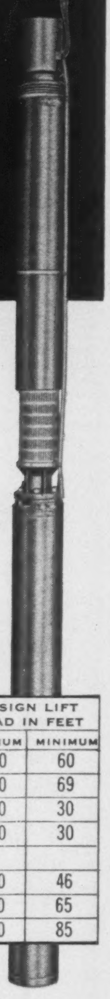
Ga.—**Hall Paving Co.**, Gainesville, Ga., LB **$99,154**, 8.03 mi. resurfacing on State Rte. 95, and 13.88 mi. resurfacing on SR. 143, Walker Co.;

Ga.—**Middle Georgia Paving & Constr. Co., Inc.**, Cochran, Ga. LB **$393,396**, 12.54 mi. widening, resurfacing on US 41, and 11.18 mi. leveling resurfacing on GA 90 ond 9.38 mi. resurfacing on GA257, Dooly and Pulaski Counties. CD 8/22/61.

▲ **GEORGIA**—State Hy. Dpt., No. 2 Capitol Square, Atlanta, Zone 3, ROADS,

C. W. Matthews Contg. Co., Inc., 199 Alexander St., Marietta, Ga., **Ballenger Paving Co.**, P.O. Box 2285, Greenville, S.C., and **Southeastern Hy. Contractors**, Mountain View Rd., Gainesville, Ga., CA **$3,138,539**, 5.17 mi. grading, paving on Atlanta Ga. to Birmingham, Ala. Road, Interstate Rte. 30, beginning end present constr. at Douglas County line extending east to Fairburn Road, Federal Aid Proj. No. I-20-1(5) 45 Contr. 1, Cobb and Fulton Counties, BA 9/1/61, CA 9/1/61. CD 9/8/61.

▲ **Markwell & Harte**, P.O. Box 6225, East Memphis Station, Memphis, Tenn., LB **$2,550,195**, Contract



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PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
D-47E	6″	55	2000	200
G-70E	6″	72	5400	180
G-120A	6″	110	3500	105
G-160	6″	150	2750	82
I-200	8″	210	2000	54
FR-300	8″	325	1250	54
J-400	8″	480	780	60

PUMP TYPE	UNIT O. D.	DESIGN CAPACITY GPM	DESIGN LIFT HEAD IN FEET	
			MAXIMUM	MINIMUM
GB-600	10″	600	600	60
KG-725	10″	800	490	69
N-500	10″	425	1100	30
N-750	11″	(c)600*	1000	30
		(a)700		
P-1000	12″	1200	1000	46
R-1500	14″	1800	700	65
T-2000	16″	2250	600	85

*(c) and (a) designate impeller cut within the same pump type.

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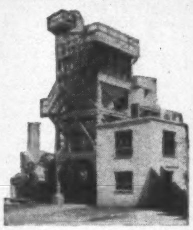

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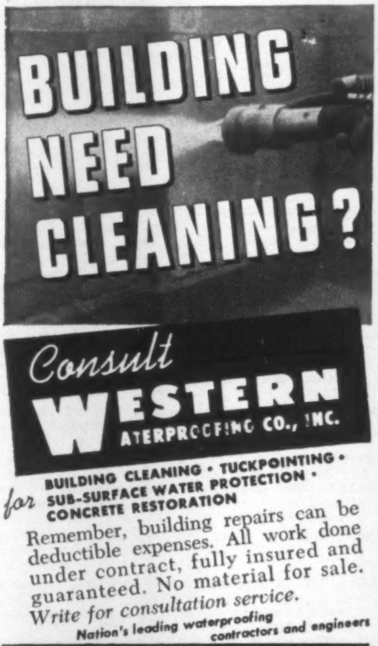

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CIRCLE 41 ON READER SERVICE CARD

A, SEWAGE TREATMENT PLANT IMPRVS. and LINES, Intrenchment Creek Water Pollution Control Plant, ATLANTA, GA. City, City Hall, Atlanta, Ga. BA 9/7/61. CD 8/2/61.

Perini Corp., 73 Mt. Wayte Ave., Framingham, Mass., LB **$457,813**, (4 bidders), MUCK EXCAVATION and EMBANKMENT approx. 4.495 mi. from SR S-704 in West Palm Beach, northwest and north to SR S-702, State Proj. Job No. 93220-3403, SR 9 (I-95), Palm Beach Co., FLORIDA. State Road Dpt. of Florida, Room 228, Holland Bldg., Tallahassee, Fla. BA 9/7/61. CD 8/25/61.

▲ **J. A. Jones Constr. Co.**, 209 W. 4th St., Charlotte, N. C., LB Base Bid **$4,495,000**, (10 bidders), HANGAR, JET ENGINE OVERHAUL and TEST FACILITIES, MIAMI, FLA. Dade County Port Authority, 10th Floor County Courthouse, Miami, Fla. Eastern Air Lines, Inc., Miami International Airport, lessee. BA 9/7/61. CD 8/15/61.

Garden Constr. Co., c/o Brockway, Weber & Brockway, engrs., Guaranty Bldg., West Palm Beach, Fla., Owner Builds, **$100,000**, WATER LINES for Palm Beach Gardens Subdivision, PALM BEACH, FLA.

Garden Constr. Co., c/o Brockway, Weber & Brockway, engrs., Guaranty Bldg., West Palm Beach, Fla., Owner Builds, **$150,000**, SANITARY SEWER LINES for Palm Beach Gardens subdivision, PALM BEACH, FLA.

Harders Constr. Co., Inc., 5521 E. Highway 98, Panama City, Fla., CA **$949,301**, MARINE TERMINAL SUBSTRUCTURE, incl. dredging, bulkheads, etc., PENSACOLA, FLA. Pensacola Port Auth., City Hall, Pensacola, Fla. BA 7/11/61. CD 7/19/61, under LB.

▲ **Cambron Constr. Co.**, P.O. Box 8515, Orlando, Fla., LB **$856,304**, est. $1,015,000, (3 bidders), Contract 650 Div. C 18 WATER SUPPLY LINES, 19,040 ft. 42 in. concrete pipe, 4,240 ft. 36 in. fittings, etc.; LB **$271,657**, est. $295,000, (3 bidders), Contract 650 Div. C 17, WATER SUPPLY LINES, 6,740 ft. 42 in. concrete pipe and fittings, etc., ST. PETERSBURG, FLA. City, City Hall, St. Petersburg, Fla. BA 9/7/61. CD 8/28/61.

Ferguson Bros. Constr. Co., P.O. Box 318, Greenwood, Miss., CA **$133,907**, GRADING, DRAINAGE, GRAVEL BASE and DOUBLE BIT. SURF. 5.665 mi. Tippo-Coward Rd., Hy. 32, FASP No. S00810(3)B, CHARLESTON, MISS. Bd. Supervs. Tallahatchie Co., Courthouse, Charleston, Miss. E. J. Miller, Jr., 521 Plaza Bldg., Jackson, Miss., engr.

▲ **TENNESSEE**—State Hy. Dpt., Nashville, ROADS,

Tenn.—**Clinchfield Concrete & Constr. Co.**, 718 Murfreesboro Rd., Nashville, Tenn., CA **$1,005,644**, paving with cement conc. sect. Southeast circumferential around Memphis, Interstate Rte. No. 240, beginning at point 0.7 mi. west of Airways Blvd., State Rte. No. 4 and U.S. 78, 2.257 mi., Proj. No. I-240-1 (40)23, Shelby Co.; CA **$1,020,129**, paving with cement conc. sect. southeast circumferential around Memphis, Interstate Rte. No. 240, Rtes. No. 4 and U.S. No. 78, 2.641 mi., Proj. No. I-240-1(41)20, Shelby Co.;

Tenn.—**McDowell & Purcell, Inc.**, 718 Murfreesboro Rd., Nashville, Tenn., CA **$3,658,541**, grading, drainage, constr. five bridges, beginning at State Rte. No. 24, Interchange, extending to near Sand Springs, 7.204 mi., Proj. No. I-40-6(16)290, Putnam Co.; CA **$1,797,939**, grading, surf. with crushed stone, bit. materials (plant mix), constr. four bridges, sect. State Rte. No. 33, 7.012 mi., Proj. No. F-033-3(5), Knox Co.;

Tenn.—**Summers-Taylor Paving Co.**, Elizabethton, Tenn., CA **$1,448,285**, paving with crushed stone, bit. materials (plant mix), sect. Interstate Rte. No. 40, 7.071 mi., Proj. No. I-40-8(14)426, Jefferson, Cocke Counties;

Tenn.—**Rea Constr. Co.**, 209 W. 4th St., Charlotte, N. C., CA **$1,927,585**, constr. cement stab. base, paving with cement conc. sect. of State Rte. No. 40, 409 mi., Proj. No. I-40-1(42)55, Haywood Co.;

Tenn.—**John L. Brinkley & Sons**, Shelbyville, Tenn., CA **$512,381**, grading, constr. two conc. bridges, 3.523 mi., Proj. No. F-028-1(17), Cumberland Co.;

Tenn.—**Inter-State Constr. Co.**, 5610 Nolensville Rd., Nashville, Tenn., CA **$578,238**, constr. crushed stone base, bit. surf. (plant mix), sect. Interstate Rte. No. 40, 4.526 mi., Proj. No. I-40-3(40)189, Cheatham and Davidson Counties;

Tenn.—**Burns & Baker**, 726 16th Ave. S., Nashville, Tenn., CA **$1,054,502**, grading, five bridges, sect. of Interstate Rte. No. 65, 5.352 mi., Proj. No. I-65-2 (10)57, Williamson Co. Grand total $13,003,180. BA 8/25/61. CD 8/31/61, under LB.

Brown Bros. Constr. Co., 1701 Central Ave., Chattanooga, Tenn., LB **$186,723**, SANITARY SEWERS, for newly-annexed areas, CHATTANOOGA, TENN. City, City Hall, Chattanooga, Tenn. BA 9/5/61. CD 11/8/57.

McCullough Contg. Co., P.O. Box 473, Murfreesboro, Tenn., LB **$102,067**, Cont. H, SANITARY SEWER LINES, COLUMBIA, TENN. City, City Hall, Columbia, Tenn. BA 9/7/61. CD 8/21/61.

C.F.W. Constr. Co. P.O. Box 915, Fayetteville, Tenn., LB **$107,000**, Cont. K, sanitary sewer lines (Columbia, Tenn.).

BUILDINGS—LB & CA

Kenbridge Constr. Co., Kenbridge, Va., LB **$209,428**, FACTORY, BLACKSTONE, VA. Blackstone Industrial Development Corp., Blackstone, Va. Roanoke Woodworking Co., lessee. BA 8/25/61. CD 8/17/61.

Lewis S. Lionberger, First Federal Bldg., Roanoke, Va., LB **$420,000**, CENTRAL OFFICE, BUCHANAN, VA. Chesapeake & Potomac Telephone Co. of Virginia, 701 East Grace, Richmond, Va.

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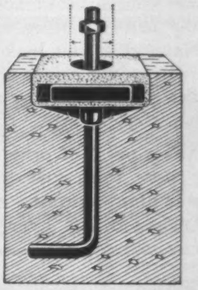

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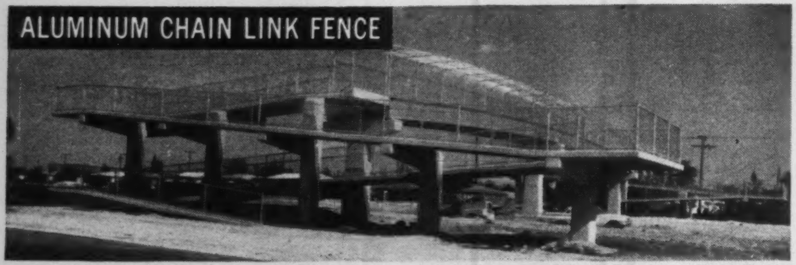
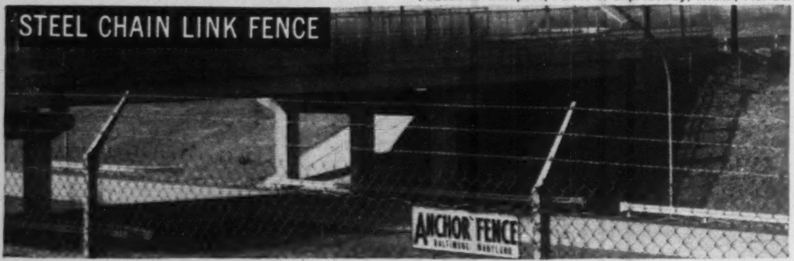


Pedestrian overpass, Palmetto Expressway, Miami, Florida.



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P. L. Anderson & Son, 115 Watson St., Danville, Va., LB **$402,241,** 1 story, 42 x 360 ft. steel, masonry NURSING HOME ADDN., DANVILLE, VA. Roman Eagle Memorial Home Inc., Danville, Va. BA 8/25/61. CD 8/2/61, under Hilltop Nursing Home as owner.

J. H. Fralin & Son, 2518 Williamson Rd., Roanoke, Va., CA **$639,300,** CONTINUED TREATMENT BLDG., Western State Hospital, CHARLOTTESVILLE, VA. Virginia State Hospital Bd., 9 North 12th, Richmond, Va. Marcellus Wright & Son, 100 East Main, Richmond, Va., archts. CA 8/30/61. CD 3/31/48.

W. H. Belanga Constr. Corp., 619 West 25th St., Norfolk, Va., CA **$870,416,** 1 story, 425 x 250 ft., rein.-con. RETAIL STORE, Government Employees Exchange, HAMPTON, VA. National Bella Hess, c/o Harry R. Dudley, Jr., archt., Colley Ave. and 45th St., Norfolk, Va. BA 8/29/61. CA 9/1/61. CD 9/1/61, under LB.

H. C. Jones Constr. Co., 8th Ave., Myrtle Beach, S. C., CA **$500,000,** 1 and 2 story, approx. 30,000 sq. ft. struc. steel, 81 unit MOTEL, incl. swimming pool, HAMPTON, VA. Hampton Motel Corp., Wire Bldg., 1000 Vermont Ave. N. W., Wash., D. C. Forrest Coile & Assocs., 3415 Warwick Blvd., Newport News, Va., archts. W. Boyce Blanchard, 3414 Warwick Blvd., Newport News, Va., engr. CD 1/24/61.

Sicash Builders, Inc., 9263 Edinburgh Dr., Lynnhaven, Va., CA Est. **$415,000,** 30 RESIDENCES, LYNNHAVEN, VA. Roosevelt Shores, Inc., 9263 Edinburgh Dr., Lynnhaven, Va.

▲ **B. F. Diamond Constr. Co.,** P.O. Box 647, Savannah, Ga., LB **$12,846,000,** (8 bidders), GENERAL CARGO TERMINAL, NORFOLK, VA. Virginia State Port Auth., Maritime Tower, Norfolk, Va. BA 9/7/61. CD 9/1/61.

▲ **Community Builders,** 1730 K St. N. W., Wash., D. C., CA Est. **$15,000,000,** 1,210 unit APARTMENTS, recreational area, pool, etc., CHARLOTTE, N. C. Green Oaks Apartment, c/o David Warren Hardwicke, archt., 303 W. Cary, Richmond, Va. E. L. Simmons, 3108 W. Leigh, Richmond, Va., mech. engr. Brockenborough & Assocs., 106 E. Cary, Richmond, Va., civil engrs. CD 3/28/61.

▲ **R. H. Wheatley Constr. Co.,** 4720 Old Pineville Rd., Charlotte, N. C., CA **$1,259,700,** general contract Hunter Huss HIGH SCHOOL, GASTONIA, N. C. Gaston Co. Bd. Educ., Osceola St., Gastonia, N. C. BA 8/30/61. CD 9/6/61, under LB.

▲ **Southeastern Development Co.,** P. O. Box 1941, Greensboro, N. C., Owner Builds, **$1,350,000,** 180 unit APARTMENT, GREENSBORO, N. C.

▲ **Wagnon & Wagnon,** 753 Edgewood Ave. N. E., Atlanta, Ga., Owner Builds, **$2,500,000** (3 years to complete), 300 HOUSES, GREENSBORO, N. C.

J. M. Thompson Co., 655 W. Lenoir, Raleigh, N. C., CA **$774,000,** 100 Student DORMITORY-INFIRMARY, RALEIGH, N. C. Meredith College, Hillsboro, Raleigh, N. C. CD 9/6/61, under LB.

McGuire Constr. Co., 57 N. Somerville St., Memphis, Tenn., CA Est. **$750,000,** MOTOR HOTEL, WINSTON-SALEM, N. C. I. W. McGuire Jr., 4395 Chickasaw Rd., Memphis, Tenn.

L. D. Long, 2025 Peachtree Rd., N. E., Atlanta, Ga., Owner Builds, **$500,000,** MOTOR HOTEL, CHARLESTON, S. C.

Daniel Constr. Co., 429 N. Main St., Greenville, S. C., CA Est. over **$500,000,** HOTEL ADDN., **alterations** GREENVILLE, S.C. Poinsett Hotel, S. Main St. Greenville, S.C. CD 11/29/60.

Daniel Constr. Co., 429 N. Main St., Greenville, S.C., CA Est. over **$200,000,** 100,000 sq. ft. WAREHOUSE GREENVILLE, S.C. J. P. Steven & Co., Old Piedmont Highway, Greenville, S.C. Harry Payne, Calhoun Towers, Greenville, S.C., archt.

Bon Constr. Co., 1924 Piedmont Rd., NE, Atlanta, Ga. CA Est. **$250,000,** WAREHOUSE-OFFICE, ATLANTA GA. Zim-Craft Mfg. Co., Inc., 533 Whitehall St., SW Atlanta, Ga.

Holder Constr. Co., Fulton National Bank Bldg., Atlanta, Ga., CA **$987,000,** OFFICE, ATLANTA, GA. Peachtree Medical Bldg., Inc., c/o Dr. Donald W. Singleton, Candler Bldg., Atlanta, Ga. BA 9/7/61. CD 8/29/61.

Lenox Constr. Co., 3393 Peachtree Rd., NE, Atlanta Ga. Owner Builds, **$600,000,** 72 APARTMENT UNITS, ATLANTA, GA.

Robert L. Mathews, 285 Hunnicutt St., NW, Atlanta, Ga. CA Est. **$250,000,** WAREHOUSE ADDN., ATLANTA, GA. The Glidden Co., 1065 Glidden St., NW, Atlanta, Ga. Wells & Taylor, 220 Wilkinson Dr., SE, Atlanta, Ga., archts.

Cohen, Walker & Bailey, 407 7th Ave., Augusta, Ga. Owner Builds, **$900,000,** 75 RESIDENCES, AUGUSTA, GA.

Holiday Inns of America, 3726 Lamar Ave., Mamphia, Tenn. Owner Builds, **$500,000,** MOTOR HOTEL, ROME, GA. William W. Bond, Jr., 3728 Lamar Ave., Memphis, Tenn., archt.

Georgia-Southern Constr. Co., P.O. Box 2098, Macon, Ga., CA **$779,779,** HOSPITAL, VIDALIA, GA. Toombs County Hospital Auth., Vidalia, Ga. BA 8/8/61. CD 8/16/61, under LB.

▲ **W. F. Thompson Constr. Co.,** 3228 Ponce DeLeon Blvd., Coral Gables, Fla., LB **$1,144,799,** (4 bidders). Collier County MUNICIPAL CENTER, Immokalee and Tamiami Trail, EVERGLADES, FLA. Bd. Commrs. Collier Co., Courthouse, Everglades, Fla. BA 9/7/61 CD 7/25/61.

▲ **Norman D. Young,** 732 E. 31st St., Hieleah, Fla., CA Approx. **$1,000,000,** 98 RESIDENCES, vicinity of 6200 and 6300 W 16th Ave., HIALEAH, FLA. S. S. & W. Inc., 801 W 49th St., Hialeah, Fla.

Lewis M. Hitt, DuPont Plaza Center, Miami, Fla., archt.

M. Marvin Cooper, 736 83rd St., Miami Beach, Fla., Owner Builds, Approx. **$400,000,** 50 units MOTOR LODGE, Howard Johnson, Roosevelt Blvd., KEY WEST, FLA. CD 8/15/61.

Taylor Constr. Co., 7100 Biscayne Blvd., Miami, Fla., CA Est. **$600,000,** CLUBHOUSE, BOAT DOCK, CABANAS, NORTH MIAMI, FLA. Silver Key Yacht & Cabana Spa, Inc., c/o Norman Giller & Assocs., archt., 975 Arthur Godfrey Rd., Miami Beach, Fla.

Algernon Blair, Inc., P.O. Box 749, Montgomery, Ala., LB **$671,000,** 85 low rent HOUSING UNITS, CULLMAN, ALA. Cullman Housing Auth., City Hall, Cullman, Ala. BA 9/6/61. CD 8/7/61.

▲ **Bishop Constr. Co.,** 2024 6th Ave. N., Birmingham, Ala., Owner Builds, **$1,200,000,** 100 RESIDENCES, Park View Estates subdivision, HUNTSVILLE, ALA.

Perrilliat & Rickey Constr. Co., Box 13128, New Orleans, La., CA **$618,400,** Westgate Girls' HIGH SCHOOL, Westgate Subdivision, Jefferson Parish, KENNER, LA. Catholic Diocese of New Orleans, 724 Camp St., New Orleans, La. Dibolls-Kessels & Assn., 637 Pere Antione Alley, New Orleans, La., archts. CA 8/28.

Building & Roads Contg. Co., P.O. Box 425, Memphis, Tenn., CA **$685,586,** HOSPITAL ADDN., ALTERATIONS, CLARKSVILLE, TENN. City and Montgomery County, Clarksville, Tenn. BA 8/15/61. CD 8/22/61, under LB.

M. A. Tipton & Son, P.O. Box 155, Alcoa, Tenn., CA Est. **$400,000,** SHOPPING CENTER, KNOXVILLE, TENN. The Kroger Co., 1014 Vine Ave., Cincinnati, O. CD 7/6/61, under LB.

▲ **Worsham Bros. Constr. Co.,** 3747 Kingston Pike, Knoxville, Tenn., CA Est. **$1,000,000,** APARTMENT TENN. Kenesaw Towers, Inc., P.O. Box 10052, Knoxville, Tenn. Good & Goodstein, 305 Magnolia Ave., Knoxville, Tenn., archts. CD 9/12/61.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

Mich., Sterling—BA 9/28—Sterling Twp. Offices, 39540 Van Dyke Ave., Sterling Twp., SEWERAGE PLANT NO. 1 ADDN., 12150 Clinton River Rd., Utica. $275,000. Plans deposit $25. Fitz Bridges, 118 Macomb St., Mount Clemens, engr. CD 8/9/61.

† **O., Cleveland**—BA 10/9—Federal Aviation Agency, Procurement Section, Room 350, Federal Bldg., New York International Airport, Jamaica, N. Y., VISUAL GLIDE SLOPE INDICATOR SYSTEM, Cleveland-Hopkins Airport, IFB-1-62-52B1.

BUILDINGS—BA

Mich., Pontiac—BA 9/26—Bd. Educ., 40 Patterson St., Proj. A-B-C, JUNIOR HIGH SCHOOL ADDN., 600 Motor St. $732,180. Plans deposit $35. Eberle M. Smith Assocs., 153 E. Elizabeth, Detroit, Zone 1, archts. CD 4/25/61.

▲ **O., Cleveland**—BA 10/3—Bd. Educ., 1380 E. 6th St., Zone 14, Hough Area ELEMENTARY SCHOOL NO. 2, Linwood and E. 85th Sts. $1,250,000. Plans deposit $20. Earl Shobe, c/o owner, engr. CD 3/9/60.

O., Cincinnati—BA 10/10—Syrian Temple, William Howard Taft Rd., 1 story, 34,000 sq. ft., brick, SYRIAN TEMPLE, $750,000. Nelson Felsberg, 2965 Montana Ave., and F. E. Betz & Assocs., Kroger Bldg., archts. Beineke & Ruehlmann, 626 Broadway, engrs. CD 10/4/60.

▲ **Ill., Wilmette**—BA 10/16—School Dist. 39, Wilmette, JUNIOR HIGH SCHOOL, CENTRAL SCHOOL REMODELING. $2,000,000. Childs & Smith, 20 N. Wacker Dr., Chicago, Zone 6, archts. CD 4/13/61.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Dpt. Hys., State Dpts. Bldgs., Columbus, Zone 15, ROAD,

John G. Ruhlin Constr. Co. and W. E. Ringwald & Sons, 1024 Home Ave., Akron, O., CA **$3,994,885,** Type T 71 and structures, 6.045 mi. USR 21, Section 11.24, EAC 1-77-4(9)137, Bath Twp. Proj. 598, Summit Co. BA 8/22/61. CD 8/25/61, under LB.

OHIO—State Dpt. Hys., State Dept., Bldgs., Columbus, Zone 15, ROAD,

rejected bids Aug. 22, Type T 35, 3.3 mi. SR 7, Sections (10.43) (19.55) Clay, Gallipolis and Ohio Twps., Proj. 606, Gallia Co. CD 8/25/61, under LB.

▲ **Penker Constr. Co.,** 1030 Summer St., Cincinnati, O., CA **$4,288,000,** COVERING EDEN PARK RESERVOIR, PUMPING STATION, CINCINNATI, O. City, City Hall, Cincinnati, O. BA 8/23/61, CA 9/8/61. CD 8/28/61, under LB.

Jas. E. Roach Constr. Co., 1076 W. Seymour, Cincinnati, O., LB **$211,908,** IMPROVE LINN ST., BANK ST. CONNECTION, CINCINNATI, O. City, City Hall, Cincinnati, O. BA 8/29/61. CD 8/23/61.

William Passalaqua Builders, Inc., 17300 Miles Ave., Cleveland, O., CA Est. **$800,000,** JET HANGAR, Cleveland Hopkins Airport, CLEVELAND, O. City, City Hall, Cleveland 14, O. Dalton-Dalton & Assocs., The Arcade, Cleveland 14, O., archts. Eastern Airlines, 10 Rockefeller Plaza, New York 20, N. Y., lessee. CD 7/5/61.

Contractors Service Co., 500 W. Sharon Rd., Cincinnati, O., LB **$208,000,** SANITARY SEWER, Compton Ridge Run, Congress Run Rd., WYOMING, O. City, 500 Grove Ave., Wyoming, O. BA 8/24/61. CD 7/26/61.

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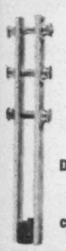
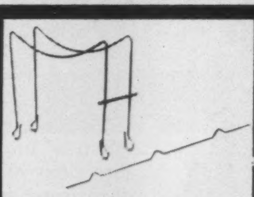
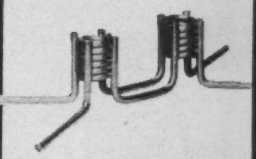


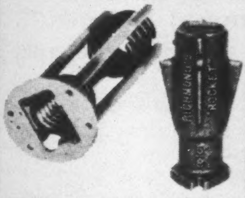
Richmond Strand Deflection and Push Down Inserts for depressing strands. Special units can also be manufactured to suit individual needs.



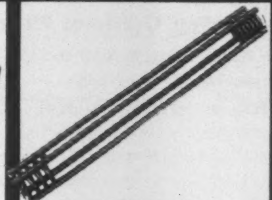
Richmond Chairs and Spacers for void supports and spirals in prestressed piles and beams.



Richmond Inserts for connection of cast-in-place diaphrams to prestressed girders.



Richmond Inserts for anchoring to or hanging from prestressed members.



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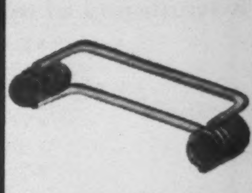
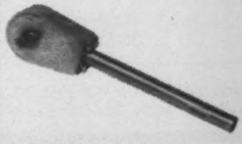


Richmond Inserts for anchoring guard rails to prestressed girders.

Phillips Self-drilling Concrete Anchors for anchoring to any concrete members after concrete has set.

Richmond Offset Free-Fit Hanger Frame-Tys used to hang forms from prestressed "I" beams.



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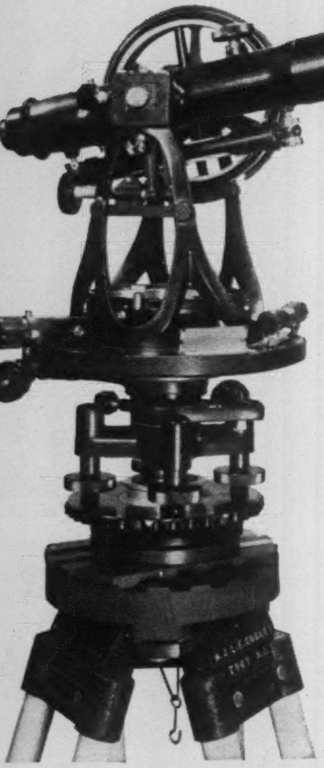

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▲ **ILLINOIS**—State Dpt. P. Wks. & Bldgs., Div. Hys., Centennial Bldgs., Springfield, ROADS,

Ill.—**Arcole Midwest Corp.**, 3225 Main St., Evanston, Ill., CA **$4,437,427**, paving, ramps, retaining walls, lighting and signing 0.67 mi. Chicago South Xway 45 to Pershing Rd., Chicago, Cook Co.; CA **$4,602,885**, paving ramps, retaining walls, lighting, signing 0.84 mi. Chicago South Xway 45 to 51 Sts., Chicago, Cook Co.;

Ill.—**Orr Constr. Co.**, 27 E. 19th Pl., Chicago Heights, Ill., CA **$1,032,331**, base course 4.02 mi. Ill. 83 and channel of inter. at Hinsdale, etc., DuPage Co. Grand total $10,072,643. BA 8/21/61. CA 9/6/61. CD 8/24/61, under LB.

▲† **LaCrosse Dredging Co.**, 140 S. Dearborn St., Chicago, Ill., CA **$1,022,011**, FLOOD CONTROL, Sny Basin, Pumping Station No. 3, Proj. 11-117-62-6, ILLINOIS. U. S. Eng., Clock Tower Bldg., Rock Island, Ill. BA 8/29/61. CD 9/7/61, under LB.

J. M. Corbett Co., 2500 Corbett St., Chicago, Ill., LB **$464,590**, est. $500,000, (4 bidders), reconstr. Randolph VIADUCT, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 8/29/61. CD 8/21/61.

▲ **Kenny Constr. Co.**, 3220 Oakton St., Skokie, Ill., LB **$1,236,180**, est. $1,400,000, (6 bidders), Auxiliary OUTLET SEWER, Beverl-Calumet System, Proj. 80.82-61-29, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. BA 9/6/61. CD 8/21/61.

Kenny Constr. Co., 3220 Oakton St., Skokie, Ill., CA **$914,983**, GRADE SEPARATION, 3 simple span DECK GIRDER BRIDGES over South Route Expressway, CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago 2, Ill. BA 8/22/61. CA 9/6/61. CD 8/28/61.

McWane Cast Iron Pipe Co., 333 N. Michigan Ave., Chicago 1, Ill., LB **$240,720**, WATER WORKS, 60,000 ft. 12 and 8 in. c.i. pipe A & B divisions, Proj. No. 27-61-54, CHICAGO, ILL. Dpt. Purchases, City Hall, Chicago 2, Ill. CD 5/3/61.

▲ **Palumbo Excavating Co.**, 2738 Harrison St., Chicago, Ill., CA **$2,213,668**, c. conc. DUAL ROAD PAVING, steel structures, curb and gutter, Proj. 066-1919-15A, 066-1919-cf CHICAGO, ILL. Bd. Comrs. Cook Co., County Bldg., Chicago, Ill. Grand total $5,397,122. BA 8/22/61 ,CA 9/6/61; CD 8/28/61, under LB.

J. M. Corbett Co., 2500 Corbett St., Chicago, Ill. and **Rock Road Constr. Co.**, 5915 N. Rogers St., Chicago, Ill., CA **$1,619,074**, PAVING PULASKI ROAD Proj. 051-2023 (Chicago, Ill.);

National Advertising Co., 6850 S. Harlem Ave., Bedford Park, Ill., CA **$503,317**, INSTALLING SIGNS, Northwest Expressway and Edens Expressway (Chicago, Ill.);

J. M. Corbett Co., 2500 Corbett St., Chicago, Ill. CA **$1,061,063**, PAVING TORRENCE AVE., BRIDGE CURB AND GUTTER, STORM SEWER, Calumet City (Chicago, Ill.) BA 8/22/61, CA 9/6/61. CD 8/1/61.

▲ **WISCONSIN**—State Hy. Comn. at office of its Construction Section, Room 535, State Office Bldg., Madison, Bids opened 9/7, ROADS,

Wis.—**Gerke Constr., Inc.**, Box 2, Rte. 5, Merrill, Wis., LB **$267,419**, grading 1.001 mi. Hy. 90, Tomah-Lake Delton Rd. (C.T.H. "M" S.T.H. 80 Section) Proj. I-90-2(58)60, Juneau Co.;

Wis.—**Fletcher Constr. Co., Inc.**, Box 67, Menomonie, Wis., LB **$202,944**, grade, subbase 5.151 mi. Stanley-East County Line and West County Line-Withee Roads, S.T. Hy. 29, Constr. 1, Proj. F 020-1(27) and F 020-1(28), Chippewa and Clark Counties;

Wis.—**Duffek Sand & Gravel Constr. Co.**, 908 Hickory St., Antigo, Wis., LB **$155,120**, grade, base course and structure B-21-2 1.212 mi. S.T. Hy. 55, Argonne-Alvin Rd. (Peshtigo River and Bridge and approaches) Contr. 1, Proj. S 0231(4), Forest Co.;

Wis.—**Murphy Constr. Co.**, Rte. 1, Black Creek, Wis., LB **$463,568**, subbase, base course 6.864 mi. U. S. Hy. 41, Appleton-East County Line Rd., Contr. 1, Proj. F 03-2(63), Outagamie Co. CD 8/17/61.

WISCONSIN—State Hy. Comn. at office of its Construction Section, Room 535, State Office Bldg., Madison, ROAD,

Reine, Schultz & Dahl, Inc., Rte. 2, Nesbitt Rd., P. O. Box 729, Madison, Wis., CA **$761,762**, conc. pavt. Hy. 90 4.662 mi. Madison-Janesville Rd. (Door Creek- C. T. H. "BN" Section), Contr. 1, Proj. I-90-3(68)144, Dane Co. BA 9/7/61. CD 9/12/61, under LB.

Druml Co., 1788 North Water St., Milwaukee, Wis., LB **$362,689**, (8 bidders), IMPROVING KINNICKIMMIC RIVER S. 16th St. to S. 20th St., Proj. 708, MILWAUKEE, WIS. Sewerage Comn. of the City of Milwaukee, P.O. Box 2079, Milwaukee, Wis. BA 9/7/61. CD 8/11/61.

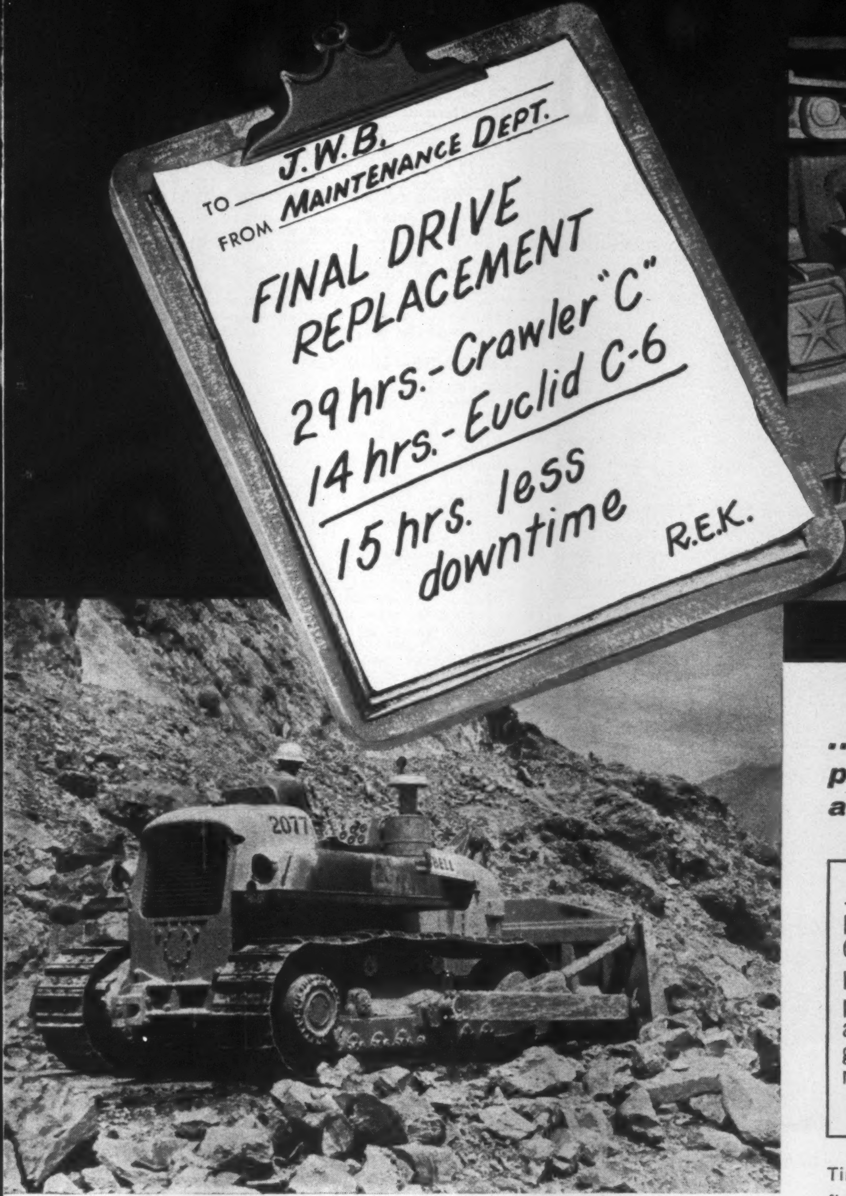
Druml Co., 1788 North Water St., Milwaukee, Wis., LB **$579,744**, (7 bidders), APRON and TAXIWAY, General Mitchell Field, Proj. 2047, MILWAUKEE, WIS. Milwaukee Co., Courthouse, Milwaukee, Wis. BA 9/6/61. CD 8/10/61.

Pure Oil Co., 4284 North Teutonia Ave., Milwaukee, Wis., Owner Builds, **$307,500**, OIL and GASOLINE STORAGE TANKS and OFFICE, MILWAUKEE, WIS.

Clinansmith Constr. Co., 150 S. Mill St., Plymouth, Mich., LB **306,940** (8 bidders), 13,690 lin. ft. 8 in. SANITARY SEWERS, 20,562 ft. 12- to 36-in. STORM SEWERS, 16,210 ft. 6- to 8-in. WATER LINES, Sherwood Hills Subdivision, BLOOMFIELD HILLS, MICH. Practical Home Builders, 13440 W. 7 Mile Rd., Detroit 36, Mich. BA 8/29. CD 8/24/61.

Oak Constr. Co., 220 E. 7 St., Royal Oak, Mich., LB **$176,662** (4 bidders), 46,680 sq. yd. c. conc. PAVING, Sherwood Hills Subdivision, BLOOMFIELD HILLS, MICH. Practical Home Builders, 13440 W.

(Continued on page 224)



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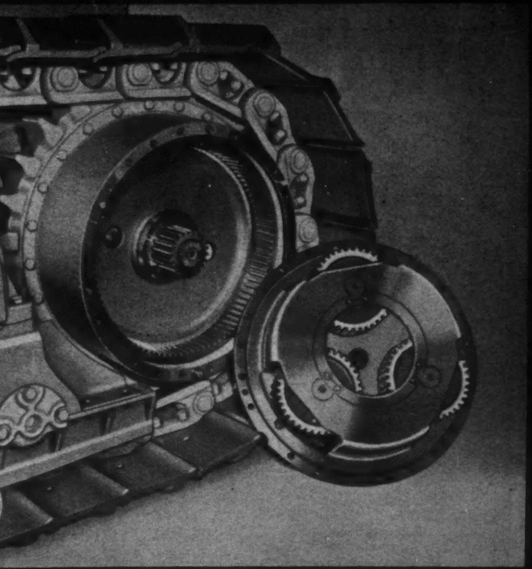
FINAL DRIVE
REPLACEMENT
29 hrs.-Crawler "C"
14 hrs.-Euclid C-6
15 hrs. less
downtime

R.E.K.



...a saving of 15 hours labor and productive time with the C-6 and no special tools required!

C-6		Crawler "C"	
Planetary Gears	3 hours	Gears and Bearings	16 hours
Inside pinion and drive gear reduction	11 hours	Top pinion from steering clutch with bearing and shaft	13 hours
Total	14 hours	Total	29 hours

Times shown are for removal and replacement of final drive with all components in place.

With a 15 hour saving for final drive replacement the "Euc" C-6 gives you 15 hours more productive time on the job! Easy accessibility that's designed into the C-6 and Euclid's time-tested planetary drive save hours of repair labor . . . that means less downtime and more production. Compare these savings in terms of lower costs . . . add the extra hours available for work on the job . . . then you'll see what just this one advantage can do in cutting operating cost.

▲ The Euclid dealer in your area would like to prove that the C-6 is the lowest cost tractor in the 200 h.p. class . . . and the most versatile by far. He's sure of it, and wants you to know the facts, too!

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WALTER BALFOUR & CO. INC. **Brooklyn 22, N. Y.**

25

(Continued from page 222)

7 Mile Rd., Detroit 35, Mich. BA 8/29. CD 8/24/61, under Sewers, etc.

Miller-Thompson Constr. Co., Inc., 24130 Telegraph Rd., Southfield, Mich., LB **$158,000,** (4 bidders), Proj. WW-26, remove existing foundations, substructures, etc., constr. rein.-con. GATE WELL, TUNNELS, BAYS, WALLS, 10100 E. Jefferson Ave., DETROIT, MICH. Detroit Water Bd., Rm. 506, 735 Randolph St., Detroit 26, Mich. BA 9/6. CD 8/23/61.

† **Forrester Constr. Co.**, 600 Sill Bldg., Flint 2, Mich., CA **$979,885 (e)** concrete, steel, masonry block OFFICERS QUARTERS **(d)** 1,792 sq. ft. steel pre-engineered LABORATORY **(c)** steel, concrete, masonry WING HEADQUARTERS **(a)** 3,080 and 710 sq. ft. CHAPEL and EDUCATION WINGS ADDNS., Kinross, ENG-20-065-61-73, KINCHELOE AIR FORCE BASE, MICH. U. S. Eng., 1101 Washington Blvd., Detroit 26, Mich. BA 8/2. CD 8/9/61, under LB.

BUILDINGS—LB & CA

Miller-Karr, Inc., Chester, O. CA **$541,500,** MEN'S DORMITORY NO. 4, Ohio University, ATHENS, O. Dpt. Pub. Wks., Ohio University, State Dpts. Bldg., Athens, O. BA 8/25/61. CA 9/5/61. CD 8/31/61, under LB.

Miller-Davis Co., 4300 North Ave., Melrose Park, Ill., CA Est. **$350,000,** 40,000 sq. ft. surgical dressings FACTORY, Rte. 14, near Jewel Park, BARRINGTON, ILL. The Kendall Co., Div. of Bauer & Black, 2500 South Dearborn St., Chicago, Ill. BA 8/25/61. CD 8/21/61.

Schirmer-Schnieder Co., 2719 Detroit Ave., Cleveland, O., CA **$788,654,** general contract Moody JUNIOR HIGH SCHOOL ADDN., BEDFORD, O. Bedford Bd. Educ., 475 Northfield Rd., Bedford, O. BA 8/25/61. CD 9/6/61, under LB.

American Homes, Inc., 2195 S. Green Rd., Cleveland 21, O., Owner Builds, **$550,000,** CIRCLE 27 DEVELOPMENT 27 homes off Lindberg Blvd. in Westview Village, CLEVELAND, O.

▲ **H & A Builders, Inc.**, 3785 Grosvenor Rd., Cleveland 18, O., Owner Builds, **$1,500,000,** $500,000 first year (3 year program), 70 HOMES, American Development, north of Plains Rd., MENTOR, O.

▲ **Teitelbaum Constr. Co.**, 5526 N. Kedzie Ave., Chicago, Ill., CA **$2,000,000,** OFFICE and paving, CHICAGO, ILL. Combined Insurance Co. of America, 5050 N. Broadway, Chicago, Ill. BA 8/7/61. CA 8/21/61. CD 7/28/61.

D. J. Velo & Co., 20 N. Wacker Dr., Chicago 6, Ill., CA **$600,000,** 80,000 sq. ft. FACTORY and OFFICE, 2830 N. Paulina St., CHICAGO, ILL. McMaster Carr Supply Co., 640 W. Lake St., Chicago, Ill. Busche & Markson, 5407 W. Addison St., Chicago, Ill., archts. CA 8/21/61.

▲ **Krilich Builders, Inc.**, 5906 N. Milwaukee Ave., Chicago, Ill., Owner Builds, **$3,600,000,** 3 story, 188 unit Village Green APARTMENTS, Golf and Elmhurst Rds., DES PLAINES, ILL.

Contemporary Builders, Inc., 774 Roosevelt Rd., Glen Ellyn, Ill., CA **$550,000,** HIGH SCHOOL ADDN., LISLE, ILL. St. Procopius Academy, Lisle, Ill. Gaul & Voosen, 165 E. Erie St., Chicago, Ill., archts. BA 8/17/61. CD 6/6/61.

John Moroff & Son, Kankakee, Ill., LB **$574,000** general contract 45,000 sq. ft. HOG PROCESSING PACKING PLANT, MOMENCE, ILL. Agar Packing Co., 4057 S. Union Ave., Chicago, Ill. Clark, Daily & Dietz, 211 N. Race St., Urbana, Ill., archts. BA 8/22/61. CD 8/17/61.

▲ **Fred Berglund & Son, Inc.**, 8410 South Chicago Ave., Chicago, Ill., CA **$1,000,000,** HIGH SCHOOL ADDN., CONVENT, RIVER FOREST, ILL. Trinity High School, 7574 W. Division St., River Forest, Ill. BA 8/15/61. CD 7/28/61.

△ **J. P. Cullen & Sons**, 330 East Eastern Ave., P.O. Box 72, Janesville, Wis., LB **$1,219,177,** (4 bidders), NURSING HOME, JANESVILLE, WIS. Rock County, Courthouse, Janesville, Wis. BA 9/6/61. CD 7/12/61.

G. Kotze Constr. Co., 3722 West Pierce St., Milwaukee, Wis., CA Est. **$125,000,** 1 story, bsmnt., 62 x 338 ft. TRUCK FREIGHT TERMINAL, MILWAUKEE, WIS. Terminal Properties Ltd., Iron Mountain, Mich. A. H. Gruppe, 828 North Broadway, Milwaukee, Wis., engr.

Schurrer Constr. Co., 2431 Pontiac Rd., Pontiac, Mich., LB **$780,000,** est. $900,000 Base Bid, steel, stone, brick, concrete CHURCH, Highland Rd., Waterford Twp., PONTIAC, MICH. Central Methodist Church, 58 Franklin St., Pontiac, Mich. BA 8/29. CD 8/14/61.

Schurrer Constr. Co., 2431 Pontiac Rd., Pontiac, Mich., CA **$743,187,** 22-room JUNIOR HIGH SCHOOL, Perch Rd. between Walton Blvd and Avon Rd., ROCHESTER, MICH. Bd. Educ., 1321 Walton Blvd., Rochester, Mich. BA 8/15. CD 8/23/61, under LB.

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

Neb., Omaha—BA 9/26—Sanitary & Imprvt. Dist. No. 72, c/o Lamp Rynearson & Associates, Inc., engr., 420 S. 17th St., ROADS, and STORM SEWER, 11,295 cu. yd. excav., 7,349 sq. yd. 8 in. and 26,535 sq. yd. 6 in. conc. paving, 1,190 ft. sewer, etc. $166,183.

▲† **Texas**—BA 9/28—U. S. Eng., P.O. Box 1229, Galveston, 6,634,000 cu. yd. CHANNEL DREDGING, ENG-41-243-62-8. $1,500,000. CD 8/22/61.

† **WYOMING**—BA 9/28—Bureau P. Rds., Room 242, Bldg. 40, Denver Federal Center, Denver, Colo., ROAD, **Carbon Co.**—4.017 mi., Forest Hy., Centennial-Saratoga, Proj 12-1(1). $400,000.

▲† **Arkansas**—BA About 10/11—U.S. Eng., P.O. Box 867, Little Rock, BANK STABILIZATION, Little Bayou Meto Cut-off Pilot Channel, Trenchfill revetment, and levee setback, River Mile 68.3 to River Mile 63.5 Arkansas River Watershed, Arkansas River, on right bank in Lincoln County, CIVENG-03-050-62-37, Approx. $1,000,000. CD 9/30/59.

† **Texas**—BA About 10/12—U. S. Eng., P.O. Box 1600, Fort Worth, DRILLING WATER WELL, Dam B Reservoir, ENG-41-443-62-27. Under $25,000.

▲ **Oklahoma**—BA 10/12—U. S. Eng., Box 61, Tulsa, RELOCATING STATE HY. ALT. NO. 9, grading, bridge, five sections, Eufaula Reservoir, Canadian River, ENG-34-066-62-17. Over $500,000. CD 9/7/61, under LB.

▲† **Minnesota**—BA About 10/13—U. S. Eng., 1217 U. S. Post Office & Custom House, St. Paul, Zone 1, local FLOOD PROTECTION Proj., Stage II, Mississippi River, St. Paul. CIVENG-21-018-62-11. Approx. $1,500,000. Plans deposit $.50.

▲† **Oklahoma**—BA 10/24—U.S. Eng., Box 61, Tulsa 2, completing Eufaula Dam POWERHOUSE, CIVENG-34-066-62-15, $5,500,000. Plans deposit $10. CD 8/30/61.

▲† **Arkansas**—BA 10/25—U. S. Eng., Gay Bldg., Little Rock, POWERHOUSE and SWITCHYARD UNITS 7 and 8, Bull Shoals Dam, CIVENG-03-050-62-29. $1,000,000. CD 11/13/51.

▲† **Kansas**—BA 10/25—U.S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo., WILSON DAM and RESERVOIR, CIVENG-23-028-62-15. $10,000,000. Plans deposit $10. CD 9/11/61.

BUILDINGS—BA

Mo., St. Louis—BA 9/28—May Stores Shopping Center, Inc., c/o Famous-Barr Co., 605 Olive St., Zone 1, 10 story 269,000 sq. ft. 800-car SELF-PARKING GARAGE, 55,400 sq. ft. RETAIL STORES and BRIDGE over Olive St. at 3rd level on 7th between Olive and Pine Sts., Over $800,000. Schwarz & Van Hoefen, 1620 Chemical Bldg., St. Louis 1, Mo. and National Garage, Inc. (Enco Engineering Co.), 1009 Cass Ave., Detroit 26, Mich., archts. CD 11/9/60, under Famous-Barr Co. as Owner.

† **N. M., Los Alamos**—BA 10/10—Atomic Energy Comn., c/o Contracts & Procurement Sec., Los Alamos, 1 story, rein.-con. frame, masonry, block walls, related work ROLLING MILL ADDN., INC-291-62-2, $500,000. Extended date. CD 8/2/61.

▲ **Tex., Arlington**—BA 11/2—Texas A & M College Systems, College Station, 4 story, 100,000 sq. ft., fl. sp. brick, granite, concrete, steel, SCIENCE BLDG. ADDN., Arlington State College, $1,799,000. Plans deposit $50. Preston M. Geren, 1607 Fort Worth National Bldg., Fort Worth, archt. CD 11/15/60.

Ark., Fayetteville—BA 11/8—Post Office Dpt., St. Louis Regional Real Estate Manager, 612 U.S. Court and Customhouse, St. Louis 1, Mo. build-lease 14,346 sq. ft. POST OFFICE BLDG., Dickson and St. Charles St.

BUILDINGS—SLC

▲ **Ark., Ozark**—Arkansas State Electric Cooperative Corp., 3111 E. Broadway, North Littel Rock, soon lets contract, combustion control, substructure and yard utilization, river intake structure, fuel oil and water tank, etc. for POWER PLANT steam generating. Burns & McDonnell, P.O. Box 173 and 4600 E. 63rd St., Trafficway, Kansas City 41, Mo., engr. CD 12/2/60.

Kan., Baldwin—Baker University, Baldwin, soon lets contract 2 story and ground floor, 164 x 102 ft. WOMEN'S DORMITORY. $582,000. Wilson & Co., 631 East Crawford St., P.O. Box 28, Salina, archts. CD 6/5/61.

▲ **Tex., Dallas**—The Automobile Mart, c/o Harwood K. Smith & Partners, archts., 506 southland Center, soon lets contract struc. steel, masonry, Unit B, 989 x 200 ft., and Unit D, 500 x 200 ft., SALES and SERVICE. $1,000,000. Herman Blum, 4930 Maple Blvd., and Mullen & Powell, Reliance Life Bldg.; and Forrest & Cotton, 600 Vaughn Bldg., engrs.

▲ **Tex., Dallas**—C. C. Young Memorial Home, Inc., 1431 Stemmons Ave., soon lets contract Blanton Gardens HOME, Unit A, 170 x 113 ft., Unit B, 158 x 113 ft., Units C, D, & E, 170 x 113 ft. $1,300,000. Fisher & Jarvis & Associates, 725 Southland Center, archts. Wm. L. Cobb & Associates, 830 Interurban Bldg., and Gregerson & Gaynor, 3010 Blackburn St., engrs. CD 8/25/61.

HEAVY CONSTRUCTION—LB & CA

† **Godbersen-Smith Constr. Co.,** Ida Grove, Iowa, LB **$527,090,** Milwaukee Railroad BRIDGES, over Little Sioux River, 1,600 ft. levee, 42,000 tons riprap, CIVENG-25-066-62-18, IOWA. U. S. Eng., 215 N. 17th St., Omaha 2, Neb. BA 9/7/61. CD 8/2/61.

Norris Constr. Co., 311 South Wapello, Ottumwa, Iowa, LB **$188,877,** ¼ mi. BLACK TOP MAIN ST., POSTVILLE, IOWA. City of Postville, City Hall, Postville, Iowa.

† **Chaney & Hope Contractors & Engineers,** Box 87, Addison, Tex., LB **$894,644,** est. $837,240 (4 bidders), OFF-SITE UTILITIES for 800 unit Capehart Housing, Proj. No. III, ENG-23-028-62-4, FORT LEONARD WOOD, MO. U. S. Eng., 1800 Federal Office Bldg., Kansas City 6, Mo. BA 8/31. CD 7/26/61, under Public Buildings.

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CIRCLE 225 ON READER SERVICE CARD

Sharp Bros. Contg. Co., 1014 E. 19 St., Kansas City, Mo., CA **$607,842,** 10 story circular, glass block CONTROL TOWER Mid-Continent International Airport, KANSAS CITY, MO. City, Dpt. P. Wks., 20 Floor, City Hall, Kansas City, Mo. BA 7/28. CD 8/16/61, under LB.

Millstone Constr., Inc., 8510 Eager Rd., St. Louis 17, Mo., CA **$763,000,** WID'N., PAVING 7 St., Barton St. north to Broadway in connection with streets in Kosciusko Proj. No. MO-4-2, Phase 1, ST. LOUIS, MO Land Clearance for Redevelopment Auth. of St. Louis, 2031 Olive St., St. Louis 3, Mo. BA 8/31. CA 9/7. CD 9/7/61, under LB.

▲ **ARKANSAS**—State Hy. Dpt., State Capitol, Little Rock, Bids opened 9/6, ROADS,

McGeorge Constr. Co., 104 Nebraska St., Pinebluff, Ark., and **Forsgren Brothers**, 3023 N. 23 St., Fort Smith, Ark. LB **$1,050,957,** Job. No. 6688, 3.738 mi. constr. interstate 40, Pulaski Co. CD 8/23/61.

ARKANSAS—State Hy. Comn., Hy. Bldg., Capitol Mall, Little Rock, Bids opened 9/6, BRIDGES,

D. F. Jones Constr. Co., 3300 Woodrow St., Little Rock, Ark., LB **$167,662,** Job No. 10669, approx. 1.132 mi. grading, drainage structures, gravel base, double bit. surface treatment on rein.-con. slab span bridge, one rein.-con. and structural steel I-beam span bridge on Strawberry-Smithville Rd., State Hy. 117, Section 1, Strawberry-Jct. Hy. 115, bridges and approaches, Federal Air Proj. S-262(3), Lawrence Co. CD 8/21/61.

▲ **ARKANSAS**—State Hy. Comn., Hy. Bldg., Capitol Mall, Little Rock, Bids opened 9/6, ROADS,

Ark.—**Ben M. Hogan & Co.**, 3200 Fairview, Little Rock, Ark., LB **$682,985**, Job No. 10658, 8.846 mi. grading, crushed stone base, b. c. hot mix base, etc., Jonesboro-Hoxie Rd., State Hy. 63, Sections 5 and 6, Federal Aid Proj. F-033-1(9), Jct. Hy. 91-Cache River Reconstruction, Craighead and Green Counties; LB **$129,172**, Job No. 3602, 3.221 mi. grading, gravel base course, bit. surf. treatment Hope-Bodcaw Rd., State Hy. 32, Section 7, Federal Aid Proj. S-499(1), Jct. Hy. 4, southeast, Hempstead Co.;

Ark.—**Ben F. Hawkins**, P.O. Box 486, Lake Village, Ark., LB **$152,917**, Job No. 2615, approx. 3.588 mi. grading, portland cement stabilized base, gravel shoulders and dbl. bit. surf. tr. DeWitt-Roe Rd., State Hy. 33, Section 1, Federal Aid Proj. S-322(5), Jct. Hy. 146-Prairie County Line, Arkansas Co.; LB **$402,586**, Job C-21-4, approx. 11.908 mi. grading, portland cement stab. base, dbl. bit. surf. tr. Arkansas-City Jct. State Hy. 1 County Rd., Federal Aid Proj. S-1142(1), Hy. 1-Arkansas City, Desha Co.;

Ark.—**Reynolds & Williams**, 3200 Brown St., Little Rock, Ark., LB **$157,929**, Job No. 2631, approx. 5.53 mi. grading, portland cement stab. base, dbl. bit. surf. tr. Monticello-Rison Rd., State Hy. 35, Section 7, Federal Aid Proj. S-473(1), Monticello-Northwest, Drew Co.; LB **$169,184,** Job. No. 11683, approx. 4.774 mi. grading, portland cement stab. base, dbl. bit. surf. tr. Seyppell-Thompson Grove Rd., State Hy. 38, Section 8, Federal Aid Proj. S-23(2), Seyppell-Jct. Hy. 147, Crittenden Co.;

Ark.—**Arco, Inc.**, 731 Mayo Bldg., Tulsa, Okla., LB **$949,516**, Job No. 4475, approx. 10.718 mi. grading, ACHM base and surface courses on Alma-Ozark Rd., State Hy. 64, Sections 2 and 3, Federal Aid Proj. F-02-1(8), Alma-Mulberry Reconstruction, Crawford and Franklin Counties;

Ark.—**W. C. Burrow Co.**, Malvern, Ark., and **Schmeckenbecher Brothers**, Sweet Home, Ark., LB **$243,501,** Job No. 10685, approx. 6.494 mi. grading, crushed stone base, dbl. bit. surf. tr. Ravenden-Jct. Hy. 93 Rd., State Ry. 90, Section 7, Federal Aid Proj. S-37(3), Ravenden Springs-Eleven Point River, Randolph Co.;

Ark.—**Four Brothers, Inc.**, Box 167, Pine Bluff Hy., Sweet Home, Ark., LB **$140,904**, Job No. 4479, approx. 3.867 mi. grading, plant mixed crushed stone base, dbl. bit. surf. tr. Wickes-East Rd., State Hy. 4, Section 1, Federal Aid Proj. S-451(1), Wickes-Howard Co. Line, Polk Co.;

Ark.—**D. B. Hill Constr. Co.**, 619 Parker St., Little Rock, Ark., LB **$263,095**, Job No. 5504, approx. 4.934 mi. grading, plant mixed crushed stone base, dbl. bit. surf. tr. Cave City-Imboden Rd., State Hy. 115, Section 3, Federal Aid Proj. S-452-(3), Jct. Hy. 58-Calamine, Sharp Co.;

Ark.—**L. S. Company, Inc.**, Lake Village, Ark., LB **$214,999**, Job No. 2630, approx. 5 mi. grading, portland cement stab. base course, dbl. bit. surf. tr. Lakeport-Shiver Rd., State Hy. 142, Section 1, Federal Aid Proj. S-472(1), Lakeport-Jct. U.S. Hy. 82, Chicot Co.;

Ark.—**McGeorge Contr. Co., Inc.**, 104 Nebraska, Pine Bluff, Ark., LB **$760,349**, Job No. 4471, approx. 8.221 mi. grading, gravel base, dbl. bit. surf. tr., bridges on "Y" City-Mt. Ida Rd. State Hy. 270, Section 2, Federal Aid Proj. F-016-1(4) FH, Wye City-East Reconstruction, Scott Co.;

Ark.—**L. E. Myers Co.**, 53 W. Jackson Blvd., Chicago, Ill., LB **$157,511**, Job No. 6687, furnishing, installing illumination facilities on Interstate Hy. in and near city of Benton, State Hy. 30, Section 2, Federal Aid Proj. I-30-2(45)115, Interstation Route Illumination (Benton), Saline Co.;

Ark.—**Southeast Constr. Co., Inc.**, 2119 W. 2 St., Pine Bluff, Ark., LB **$327,926**, Job 2551, approx. 1.755 mi. grading, wid'n., plant mixed crushed stone base, b. conc. hot mix base and surface courses resurf. on Little Rock-Pine Bluff Rd., State Hy. 65, Section 14, Federal Aid Proj. U-016-2(11), Pine Bluff-City Connection, Jefferson Co. CD 8/21/61.

▲† **Paul Hardeman, Inc.**, 10579 Dale St., Stanton, Calif., LB **$3,297,672**, est. $3,716,537, (7 bidders), Greers Ferry, POWERHOUSE, Cleburne Co., CIVENG-03-050-62-1, ARKANSAS. U. S. Eng., Gay Bldg., Little Rock, Ark. BA 9/6/61. CD 8/4/61.

† **Markham & Brown Co.**, 1961 Industrial Blvd., Dallas, Tex., LB **$347,574**, est. $330,712, (4 bidders), BANK STABILIZATION on Arkansas River at Adkins Lake, Maddin and Richland Bend, CIVENG-03-050-62-22, ARKANSAS. U. S. Eng., Gay Bldg., Little Rock, Ark. BA 8/29/61. CD 8/4/61.

† **Yancy B. Turner**, 914 West 13th Ave., Pine Bluff, Ark., LB **$454,240,** BANK STABILIZATION WORK Arkansas River, River Mi. 73.1 to 74.3, Sqan Lake Standard Revetment, CIVENG-03-050-62-20, ARKANSAS. U. S. Eng., Gay Bldg., Little Rock, Ark. (**Correction**—low bidder). CD 9/5/61, under LB.

† **Yancy B. Turner**, 914 W. 13th Ave., Pine Bluff, Ark., & **McAlister Constr. Co.**, P. O. Box 5465, Memphis, Tenn., LB **$597,130**, est. $678,522, (7 bidders), BANK STABILIZATION, Arkansas River below Pendleton, CIVENG-03-050-62-25, ARKANSAS. U. S. Eng., Gay Bldg., Little Rock, Ark. BA 8/31/61. CD 8/4/61.

▲† **Missouri Valley Constr. Co.**, Grand Island, Neb., LB **$1,152,989**, est. $1,135,148 (3 bidders), EARTHWORK, CONC. LINING STRUCTURES for Sect. No. 1, Ainsworth Canal, Missouri River Basin Proj., Proj. No. DC-5642, Valentine, NEBRASKA. Bureau Reclamation, Dpt. Interior, Bldg. LA, Denver Federal Center, Denver, Colo. BA 9/6/61. CD 8/2/61.

Cornhusker Paving Co., 3111 South 67th Ave., Omaha, Neb., LB **$105,223**, est. $140,315, (6 bidders), STREETS and STORM SEWERS, 17,081, 8 in. P. C. C. pavement with integral curb, 2,990 ft. 15- to 36-in. RCP sewer, OMAHA, NEB. Sanitary & Imprvt. Dist. No. 80, J. S. Nyquist, clk., 309 S. 72nd St., Omaha, Neb. BA 9/6/61. CD 8/14/61.

Dugdale Constr. Co., 2728 N. 85th St., Omaha, Neb., LB **$784,429**, est. $1,040,000 (4 bidders), 1,500 RUNWAY EXTENSION, taxiway constr., widening existing runways, blast pads, storm sewers, new lighting, fence, Proj. No. 9-25-027-6114, OMAHA, NEB. Omaha Airport Authority, Richard E. Mooney, dir., Eppley Airfield, Omaha, Neb. BA 9/8/61. CD 8/22/61.

† **Riddle Quarries, Inc.**, National Bank of America Bldg., Salina, Kan., LB **$825,633**, est. $912,147 (6 bidders), RELOCATION 21 mi. COUNTY ROADS, John Redmond Reservoir, Burlington, Coffey Co., ENG-34-066-62-5, KANSAS. U. S. Eng., P.O. Box 61, Tulsa, Okla. BA 8/31/61. CD 8/18/61.

† **International Boundary & Water Comn.**, Mart Bldg., 206 San Francisco St., El Paso, Tex., rejected bids Aug. 18, Schedule 4, SIGNAL SYSTEM, incl. relocation of Western Union Facilities, Amistad Dam, UDA 6457, TEXAS. LB **$202,000.** Will re-advertise. CD 8/22/61, under LB.

▲† **Massman Constr. Co. & John F. Beasley Constr. Co.**, 3917 Broadway, Kansas City 11, Mo., CA **$5,159,405,** Schedule 1, Texas & New Orleans RAIL

(Continued on page 228)

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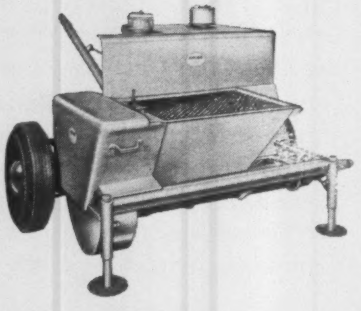

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(Continued from page 226)

ROAD RELOCATION, Devils River & Nixon Creek Bridges, Amistad Dam, Rio Grande International Dams Project, Val Verde Co., UDA 6457, TEXAS. International Boundry & Water Comn., Mart Bldg., 206 San Francisco St., El Paso, Tex. Grand total $9,106,362. BA 8/18/61. CD 8/22/61, under LB; **Collins Constr. Co. of Texas**, Box 1192, Austin, Tex., CA **$2,581,982**, Schedule 2, GRADING, for Amistad Dam, (Texas);
W. A. Smith Constr. Co., Inc., P. O. Box 15217, Houston, Tex., CA **$1,364,975**, Schedule III, TRACK, for Amistad Dam, (Texas)

▲ **J. C. Evans**, Box 9027, Austin, Tex., LB **$1,448,000**, WATER FILTRATION PLANT ADDN., AUSTIN, TEX. City, c/o W. T. Williams, city mgr., City Hall, Austin, Tex. BA 9/5/61. CD 8/24/61.

Brown & Root, Inc., Box 3, Houston 1, Tex., LB **$322,905**, CONC. CURBS and GUTTERS, ASPHALT PAVING, Greenwood Drive, Port Ave. to Horne Road, CORPUS CHRISTI, TEX. City, City Hall, Corpus Christi, Tex. BA 8/23/61. CD 2/9/61.

† **Brown & Root, Inc.**, P.O. Box 3, Houston, Tex., CA **$560,226**, International Airport RUNWAYS, TAXIWAYS, HOUSTON, TEX. Federal Aviation Agency, Houston International Airport, Houston, Tex. CD 8/30/61, under LB.

McKnight & Little, 1710 Telephone Rd., Houston, Tex., LB **$259,871**, (3 bidders). Sims Bayou FLOOD CONTROL, Telephone Rd. and Mykawa Rd., HOUSTON, TEX. Harris County, Comnrs. Court, Courthouse, Houston, Tex. BA 9/5/61. CD 7/7/53.

† **Darragh & Lyda**, P.O. Box 5296, San Antonio 1, Tex., LB **$192,213**, est. $209,567, (9 bidders), F-102 FACILITIES, Texas Air National Guard, Kelly Air Force Base, San Antonio, ENG-41-443-62-6, KELLY AIR FORCE BASE, TEX. U.S. Eng., P.O. Box 1600, Fort Worth, Tex. BA 9/7/61. CD 9/5/61.

Cameron County Fresh Water Supply Dist. No. 1, Port Isabel, Tex., rejected bids Aug. 23, RAW WATER LINES, 3 PUMP STATIONS, 2 EARTHEN DAMS, PORT ISABEL, Over **$500,000**. CD 8/16/61.

Schwope, Inc., Contractors, 6623 W. Commerce St., San Antonio, Tex., CA **$534,126**, est. $589,902, (8 bidders), 700 lin. ft. STORM DRAINAGE, channel, Ry. Tracks west to Wagner St., Dwight Ave., Proj. No. 65-A, SAN ANTONIO, TEX. City, City Hall, San Antonio, Tex. BA 9/5/61. CD 8/16/61.

† **Bureau Reclamation, Dpt. Interior**, Bldg. 53, Denver Federal Center, Denver 25, Colo., rejected bids July 18, thirty-three RESIDENCES for Yellowtail dam government community, Missouri River Basin Project, Hardin, Big Horn Co., Proj. 600C-193, MONTANA. Will re-advertise. CD 8/4/61, under LB.

▲† **Zook Brothers Constr. Co.**, 1026 11th Ave. North, Great Falls, Mont., **COP Constr. Co.**, 617 Central Ave., Billings, Mont., and **Lewis Constr. Co.**, 925-10th Ave. North, Great Falls, Mont., LB **$2,420,613**, est. $2,298,525, (6 bidders), Barratts diversion DAM, East Bench canal, Sta. 1 plus 92.6 to 1302 plus 00 and East Bench laterals, 3.7 to 19.2 inclusive, Missouri River Basin Project, Dillon, Beaverhead Co., DC 5638, MONTANA. Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver 25, Colo BA 9/7/61. CD 9/6/61.

Newstrom Davis & Co., Box 366, Denver, Colo., LB **$824,567**, est. $698,399, (7 bidders), WATER FILTER PLANT, ARVADA, COLO. City, City Hall, Arvada, Colo. BA 9/8/61. CD 8/25/61.

▲ **NEW MEXICO**—State Hy. Dpt., State Hy. Bldg., Cerrillos Road, Santa Fe, Bids opened Sept. 6, ROADS,
N. M.—**Brown Constr. Co.**, 3525-4th St. N.W., Albuquerque, N. M., LB **$581,735**, two-lane constr., 12.63 mi. Interstate Rte. 25 north of Las Cruces, Dona Ana Co.; LB **$388,866**, four-lane constr., on Lohman and Main Sts., 1.304 mi., Dona Ana Co.; LB **$268,262**, imprvt. 4.084 mi. of School Bus Rte. from Cuba in Direction of Johnson Trading Post, Sandoval Co.;
N. M.—**Skousen Constr. Co.**, 208 Springer Bldg., Albuquerque, N. M., LB **$696,626**, reconstr. two-lane U. S. 56 bet. Springer, 9.479 mi., Colfax Co. CD 8/21/61.

† **Mulvaney Constr. Co.**, 2916 Arno NE, Albuquerque, N.M., LB **$123,123**, Middle Rio Grande Proj., ROADS, **parking areas, boat launching ramps, picnic tables, shelters, fireplaces** for El Vado Reservoir recreational facilities, Proj. No. 500C-108, Albuquerque, Bernalillo Co., NEW MEXICO. Bureau of Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo. BA 8/22/61. CD 8/8/61.

† **United Constructors, Inc.**, 11947 Wilshire Blvd., Los Angeles Calif., LB **$160,500**, FUEL CATCHMENT TANK SYSTEM, Walker Air Force Base, ENG-29-005-62-3, ROSWELL, N.M. U.S. Eng., P.O. Box 1538, Albuquerque, N.M. BA 8/22/61. CD 7/19/61.

BUILDINGS—LB & CA

▲ **G. F. Cook Constr. Co.**, 2833 Lyndale Ave. S., Minneapolis, Minn., CA. **$1,827,000**, HOUSING for the ELDERLY, Site No. 11, MINNEAPOLIS, MINN. Minneapolis Housing & Redevelopment Auth., 215 Public Health Center Bldg., Minneapolis, Minn. BA 8/15. CD 8/18/61, under LB.

Joseph J. Grillion Constr. Co., 143 Brown Rd., Bridgeton, Mo., Owner Builds, **$400,000**, 40 RESIDENCES, Surrey Meadows Subdivision adjacent to Trotter Way and Hy. 140, FLORISSANT, MO.

▲ **J. S. Alberici Constr. Co. Inc.**, 1550 Irving Ave., St. Louis 20, Mo., CA Est. Over **$1,500,000**, 1 story 153,000 sq. ft. FINAL PROCESSING PLANT, 30,976 sq. ft. CAR LOADING BLDG. and 10,400 sq. ft. Bldg. Addn. at 3935 Union Blvd., ST. LOUIS, MO. General Motors Corp., Chevrolet Motors Div., 3801 N. Union Blvd., St. Louis 15, Mo. Albert Kahn Assocs., Architects & Engineers, Inc., 345 New Center Bldg., Detroit 2, Mich., archt.-engr. BA 8/4.

Fruin-Colnon Contg. Co., 1706 Olive St., St. Louis 3, Mo., CA Est. **$250,000**, 1 story, 188 x 229 ft., WAREHOUSE-OFFICE, 1248 Research Blvd., Lindbergh-Warson Industrial Area, ST. LOUIS COUNTY (ST. LOUIS 32 P.O.), MO. Rock Island Millwork Co., Rock Island, Ill.

Murch-Jarvis Constr. Co., 718 Olive St., St. Louis 1, Mo., CA Est. Over **$250,000**, (9 bidders), 1 story, 50,000 sq. ft. WAREHOUSE-OFFICES, Gateway and Research Blvds., Lindbergh-Warson Industrial Center, ST. LOUIS COUNTY (ST. LOUIS 32 P.O.), MO. Butler Paper Co., 3400 Market St., St. Louis 3, Mo. BA 7/20. CD 7/17/61.

▲ **Knowlton Co.**, 1133 West Columbus Ave., Bellafontaine, O., LB **$547,000** (maintenance obligation of govt.), LB **$690,000** (maintenance obligation of the lessor) build-lease 318,000 sq. ft. POST OFFICE and MAIL HANDLING FACILITY, 26,277 sq. ft. GARAGE and VEHICLE MAINTENANCE, OMAHA, NEB. Postal Dpt., Room 311, Post Office Bldg., Wichita, Kan. BA 9/7/61, CD 7/6/61;

Leabank Co., 1900 Wyoming Ave., El Paso, Tex., LB **$547,500** (maintenance obligation of govt.) LB **$690,000**, (maintenance obligation of lessor) for POST OFFICE, (Omaha, Neb.);

Thomas McCloskey & Co., 1620 West Thompson, Phila., Pa., LB **$540,000** (maintenance obligation of the govt.) LB **$690,500** (maintenance obligation of the lessor) for POST OFFICE, (Omaha, Neb.) Total est. cost $5,500,000.

Vollmer Constr. Co., 840 North Main St., Wichita, Kan., LB **$574,290**, (6 bidders), general contract 1 story, 80,000 sq. ft. Rea Woodman ELEMENTARY SCHOOL, WICHITA, KAN. Wichita Bd. Educ., 428 South Broadway, Wichita, Kan. BA 8/23/61. CD 8/15/61.

Wynn Constr. Co., 1312 South Walker St., Oklahoma City, Okla., CA **$468,000**, est. $500,000, (4 bidders), remodel club into APARTMENT HOTEL, OKLAHOMA CITY, OKLA. George E. Phelphs, Inc., 202 West Sheridan Ave., Oklahoma City 2, Okla. Turnbull & Mills, Commerce Exchange Bldg., Oklahoma City 2, Okla., archts. CA 9/1/61.

Warrior Constr. Co., Inc., P. O. Box 74, Houston, Tex., LB **$528,714**, est. $445,000, 2 story, 40 x 170 ft., brick ADMINISTRATION, 3 story, 70 x 150 ft., brick CLASSROOMS, AUSTIN, TEX. Austin Presbyterian Theological Seminary, 100 W. 27th St., Austin, Tex. BA 8/29/61. CD 8/18/61.

Thad Dederick Constr. Co., Box 13067, Houston, Tex., CA **$646,780**, ELEMENTARY SCHOOL and combination ELEMENTARY and HIGH SCHOOL, CHINA, TEX. Hardin-Jefferson Ind. School Dist., China, Tex. BA 8/10/61. CD 8/31/61, under LB.

Wm. Matera, 2616 Bandera Rd., San Antonio, Tex., LB **$828,225**, est. $1,000,000 (10 bidders), 2 and 3 story, 47,000 sq. ft., concrete, brick, SCHOOL OF ARCHITECTURE, COLLEGE STATION, TEX. A & M College of Texas, System Admin. Bldg., College Station, Tex. BA 9/7/61. CD 8/22/61.

Alford Refrigerated Warehouse, 318 Cadiz St., Houston, Tex., Owner Builds, **$900,000**, 154,000 sq. ft. WAREHOUSING EXPANSION, Cadiz St. off Industrial Blvd., DALLAS, TEX. CD 4/10/57.

Joe Holler, Builder, 3158 Walnut Hill Lane, Dallas, Tex., Owner Builds, **$448,000**, 24 DWELLINGS, Wynnewood Hills, DALLAS, TEX.

▲ **W. H. Wallace Constr. Co.**, 2330 Hardwick St., Dallas, Tex., CA **$1,547,000**, Bishop Lynch Memorial HIGH SCHOOL, DALLAS, TEX. Catholic Diocese of Dallas-Forth Worth, 2122 Kidwell St., Dallas, Tex. BA 8/21/61. CD 8/29/61, under LB.

▲ **Jack G. Simpson Constr. Co.**, 16211 Aber St., Houston, Tex., CA **$1,689,700**, 79 DWELLINGS, College Park and Braeburn Valley Drive, and Sect. 3, Sharpstown, HOUSTON, TEX. College Park, Inc., 16211 Aber St., Houston, Tex.

▲ **Skyline Constr. Co.**, 8849 Long Point, Houston, Tex., CA **$1,375,000**, fourteen 2 story, 118 unit masonry APARTMENT, 2 reflection pools, W. Alabama St., HOUSTON, TEX. Fred D. Taylor, Frank C. Anderson, Jr., Henry M. Anderson, and Dr. Vincent C. Bash, Jr., 8849 Long Point, Houston, Tex. Kim Gawlik & Dave Strickler, 4189 Bellaire Blvd., Houston, Tex., archts.

▲ **Nickabob, Inc.**, Leander, Tex., Owner Builds, **$4,415,000**, 85 DWELLINGS, olympic type swimming pool, playgrounds, docks, between Kingsville and Granite Shoals Lake, KINGSVILLE, TEX. CD 8/9/61.

▲ **R. H. Smith & Co.**, 1915 Kolfahl St., Dallas, Tex., LB **$1,792,000**, est. $3,200,000, (5 bidders), MEMORIAL HOSPITAL, LA MARQUE, TEX. Galveston County Memorial Hospital, c/o County Judge, Courthouse, Galveston, Tex. BA 8/30/61. CD 7/18/61.

Wade Constr. Co., Altus, Okla., CA **$500,000**, GRANERY, FM Rd. 1763, VERNON, TEX. Vernon Grain Co., Vernon, Tex.

D. W. Marshall Constr. Co., 1007 E. North St., Victoria, Tex., CA **$637,000**, masonry, Patti Welder JUNIOR HIGH SCHOOL, VICTORIA, TEX. Victoria Ind. School Dist., 1611 E. North St., Victoria, Tex. BA 8/25/61. CD 8/16/61.

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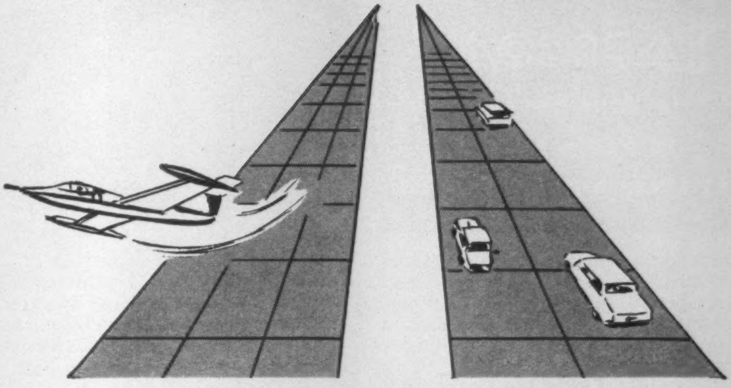

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Brown-Schrepferman & Co., 240 Washington St., Denver, Colo., LB **$613,000,** est. $750,000, (8 bidders), general contract 81 unit, 11 story, 56,000 sq. ft. APARTMENT FOR THE ELDERLY, BOULDER, COLO. First Presbyterian Church, 1540 Walnut St., Boulder, Colo. BA 9/6/61. CD 8/25/61.

▲ **Lippert Brothers,** P. O. Box 8305, Denver, Colo., LB **$1,643,343,** est. $2,049,500, (4 bidders), 3 story, bsmnt., WOMEN'S DORMITORY (Parmalee Hall) FORT COLLINS, COLO. Colorado State University, Campus, Fort Collins, Colo. (State Planning Comn., State Capitol, Denver, Colo.). BA 9/7/61. CD 8/24/61.

▲ **Lembke Constr. Co.,** Box 771, Colorado Springs, Colo., LB **$1,346,774,** est. $1,400,000, (6 bidders), 1 and 2 story, part bsmnt. 80,000 sq. ft. HIGH SCHOOL in Skyway Park, COLORADO SPRINGS, COLO. School Dist. No. 12, 1201 W. Cheyenne Blvd., Colorado Springs, Colo. CD 8/25/61, under LB.

Jerry Aronoff, 20 South Fairfax, Denver, Colo., CA Approx. **$750,000,** 4 story, 72-unit MOTEL, 50,000 sq. ft. SWIMMING POOL, DENVER, COLO. 4610 Corp., Marvin J. & Victor Lederman, c/o Roland Wilson, archt., 1301 E. Colfax, Denver, Colo.

R. T. Bickhard Constr. Co., P. O. Box 97, Highland Station, Denver, Colo., LB **$841,835,** (9 bidders), 4 story, 46,234 sq. ft. OFFICE, Valley Highway and Bellview Ave., DENVER, COLO. Colorado Education Assn., 1605 Pennsylvania, Denver, Colo. BA 9/6/61. CD 8/22/61.

C J W, Inc., c/o Krabacher & McMechen, archts., 8582 W. Colfax, Denver, Colo., Owner Builds, Approx. **$500,000,** 3 story, 60 unit APARTMENT, 18th and Fenton Sts., DENVER, COLO.

▲ **Vincent A. Rieger,** 4125 Valley Hy., Denver, Colo., Owner Builds, Approx. **$1,500,000,** 12 story, 183 x 78 ft., 104 units Wellshire Arms APARTMENT, DENVER, COLO. Ramsey & Reeves, 882 Lipan, Denver, Colo., archts.

Craftsmen Constr. Co., 1337 E. 18th Ave., Denver, Colo., LB **$541,228,** (6 bidders), combined bids, (A) Lakewood HIGH SCHOOL ADDN., (B) Wheat Ridge HIGH SCHOOL ADDN., LAKEWOOD, COLO. Jefferson County School Dist. No. R-1, 1580 Yarrow, Lakewood, Colo. Ralph D. Peterson & Assocs., 1750 Humboldt, Denver, Colo., archts. Joe W. Sallada & Hanson, 1718 Gaylord St., Denver, Colo., struct. engrs., Swanson & Rink Assocs., 1640 Boulder St., Denver, Colo., mech. engrs. CD 11/14/55.

▲ **Wilkins Constr. Co., Inc.,** 1655 High St., Boulder, Colo., CA **$1,560,000,** 1 and 2 story, 104,746 sq. ft. Bear Creek JUNIOR-SENIOR HIGH SCHOOL, LAKEWOOD, COLO. School Dist. R-1, 1580 Yarrow, Lakewood, Colo. BA 8/29/61, CA 9/7/61. CD 9/5/61, under LB.

▲ **Jack Lopata, Ernest Madison, Adolph Kaufman, Fred Maier & Herman Schldon, c/o Jack Lopata,** 99 S. Dahlia, Denver, Colo., Owner Builds, Approx. **$5,000,000,** Monterey Hills SHOPPING CENTER, incl. department store, supermarket, shops, drive-in banking facilities, 600 seat theater, THORNTON, COLO.

C. S. Lambie Co., Box 1167, Amarillo, Tex., CA **$642,734,** (9 bidders), ACADEMIC, PORTALES, N. M. Eastern New Mexico University, Bd. Regents, Portales, N. M. BA 8/24/61. CD 8/16/61.

FAR WEST

HEAVY CONSTRUCTION—BA

Calif., Hollywood—BA 10/3—Century City (Aluminum Corp. of America and Webb & Knapp, Inc.), 10201 W. Pico Blvd., Los Angeles, SITE IMPRVS., incl. GRADING, Century City. $250,000. Plans deposit $100. Daniel, Mann, Johnson & Mendenhall, 3325 Wilshire Blvd., Los Angeles, archts. CD 12/19/60.

Calif., Los Angeles—BA 10/6—Los Angeles County Flood Control Dist., 2250 Alcazar St., Proj. 556 Part 1, Monterey Park STORM DRAIN, Monterey Park. $795,600. CD 11/10/58.

▲ **Calif., Montecito**—BA About 10/9—Montecito Sanitary Dist., Court House, Santa Barbara, SEWERAGE FACILITIES, Assessment District No. 1. $1,953,500. Plans deposit $20. Engineering-Science Inc., 150 E. Foothill Blvd., Arcadia, engr. CD 9/24/57.

† **Utah and Wyoming**—BA 10/10—Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo., one HOIST STRUCTURE for 16.75 ft. x 34 ft. fixed wheel gate, for spillway, Flaming Gorge Dam, Colorado River Storage Project, DS 5664. CD 9/7/44.

BUILDINGS—BA

Calif., San Luis Obispo—BA 10/3—State Div. Architecture, 1120 N St., Sacramento, SCIENCE BLDG. ADDN., California State Polytechnic College, W.O. Ad03 016 C. $475,000. Plans deposit $25. CD 5/6/60.

Alaska College—BA 11/15—University of Alaska, College, fifteen 30 unit HOUSING for Faculty. Over $400,000 Plans deposit $25. Gray, Rogers & Osborne, College Rd., Fairbanks, Alaska, archts.

HEAVY CONSTRUCTION—LB & CA

▲ **UTAH**—State Rd. Comn., State Capitol, Salt Lake City, Bids opened 9/5, ROADS,

W. W. Clyde Constr., Box 231, Springville, Utah, LB **$2,230,447,** est. $2,556,553 (4 bidders), graded, drained roadway, Interstate 15 for 4.747 mi., Proj. I-15-6(10)276, Utah Co., CD 8/28/61; LB **$176,243.** est. $199,234 (2 bidders), plant mix bit. surf. 1.219 Interstate 15, Proj. F-019-1(4), Utah Co. CD 8/18/61.

(Continued on page 232)

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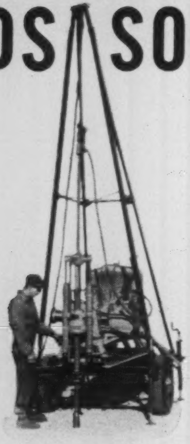

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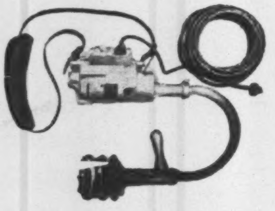

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CIRCLE 48 ON READER SERVICE CARD

(Continued from page 230)

▲† **Electrical Constructors,** P. O. Box 2178, Columbus 16, O., CA **$4,854,544,** est. $4,879,785, (9 bidders), Colorado River Storage Project, Glen Canyon Ship Rock 230 kv. TRANSMISSION LINES, DC 5610, ARIZONA and NEW MEXICO. Bureau Reclamation, Dpt. Interior, Bldg. 53, Denver Federal Center, Denver, Colo. BA 7/18/61, CA 9/6/61. (**Correction**—contractor). CD 8/15/61, under CA.

WASHINGTON—State Hy. Comn., Transportation Bldg., Olympia, Bids opened 9/6, BRIDGE,

Woodworth & Co., 1200 E. D St., Tacoma, Wash. LB **$246,980,** (10 bidders), two prestressed concrete girder bridges, illumination for Portland Ave. overcrossing 0.041 mi. Primary State Hy. 1, FA I-5-3-(114)134, Pierce Co. CD 8/16/61.

WASHINGTON—State Hy. Comn., Transportation Bldg., Olympia, Bids opened 9/6, ROADS,

Wash.—**W. B. Davis Constr. Co.,** Rte. 2, Box 35, Olympia, Wash., LB **$98,681,** (1 bidder), grading, surf. b. conc. paving 0.37 mi. 14th Ave. approach to capitol from freeway, Thurston Co.;

Wash.—**Associated Sand & Gravel Co.,** 6300 Glenwood Ave., Everett, Wash., LB **$102,904,** (3 bidders), grading, surf., bit. surf. treatment, b. conc. paving 2.941 mi. Primary State Hy. 1, Hickox Rd. to 1st St., Mount Vernon, Skagit Co. CD 8/16/61.

WASHINGTON—State Hy. Comn., Transportation Bldg., Olympia, ROAD,

Woodworth & Co., Inc., 1200 E. D St., Tacoma, Wash., CA **$660,248,** (7 bidders), draining, surf., erosion control, bit. surf. treatment, c. conc., cement concrete paving, fencing 3.861 mi. Primary State Hy. 1, Tacoma, FA I-5-3(129)135, Pierce Co. BA 9/6/61. CD 8/16/61.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/6, ROADS,

Calif.—**Watson Constr. Co. & Lew Jones Constr. Co.,** 873 81 Ave., Oakland, Calif., LB **$3,950,236** (10 bidders), grading, paving 12.2 mi. four lane freeway US Hy. 99, incl. 7 bridges between 2 mi. north of Red Bluff and Shasta Co. Line south of Cottonwood, Tehama Co.;

Calif.—**Madonna Constr. Co.,** P.O. Box 910, San Luis Obispo, Calif., LB **$2,218,691** (5 bidders), grading, paving 6.1 mi. four lane freeway US Hy. 101 between 2.3 mi. south and 2.3 mi. north of Gonzales, Monterey Co. CD 8/2/61.

E. A. Weitzul & Assoc., 2109 N. Dancove Dr., West Covina, Calif., LB **$116,000,** est. $120,000 (6 bidders), SWIMMING POOL, COMPTON, CALIF. Compton Junior College Dist., 111 E. Artesia Blvd., Compton, Calif. BA 8/29. CD 8/9/61.

▲ **Connolly-Pacific Co.,** 1925 Water St., Long Beach, Calif., LB **$1,327,312,** est. $1,400,000 (5 bidders) WHARF at Pier G, Berths 212-215, Long Beach Outer Harbor, LONG BEACH, CALIF. Long Beach Harbor Dpt., 925 Harbor Plaza, Long Beach, Calif. BA 8/30. CD 2/5/58.

▲ **Kaiser Engineers,** 300 Lakeside Dr., Oakland, Calif., CA Est. **$2,000,000,** design and construct BULK UNLOADING PLANT, LONG BEACH, CALIF. Metropolitan Stevedore Co., 211 N. Marine St., Wilmington, Calif.

Altfillish Constr. Co., 2787 S. La Mirada Ave., La Habre, Calif., CA **$445,990,** EXTEN. Slauson Ave. from Norwalk Blvd. in Santa Fe Springs Area easterly to Painter Ave. in South Whittier, Proj. CC 40939, LOS ANGELES, CALIF. Los Angeles Co., 500 W. Temple St., Los Angeles, Calif. BA 8/22. CD 8/1/61.

Montebello Sewer Co., Inc., 140 E. Whittier, Montebello, Calif., LB **$574,065,** (10 bidders), two STORM DRAINS, Alhambra-San Gabriel Area, Proj. 573, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 8/25. CD 7/24/61.

John L. Meek Constr. Co., Inc., 8540 Venice Blvd., Los Angeles 34, Calif., CA **$113,683,** est. $120,000, reconstr. east end span of BRIDGE, Rosecrans Ave. and Los Angeles River, LOS ANGELES, CALIF. Los Angeles Co., 500 W. Temple St., Los Angeles, Calif. BA 8/22. CA 8/29. CD 8/9/61.

Pacific Allied, 7605 Wheatland Ave., Sun Valley, Calif. LB **$910,679,** est. $1,206,400 (10 bidders), Veteran Ave., Unit 2, STORM DRAIN and Stone Canyon CHANNEL, Proj. 498, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 9/1. CD 8/1/61.

▲ **N. P. Van Valkenburgh Co.,** 1627 Chico, South El Monte, Calif., LB **$1,310,160,** (8 bidders), Whittwood STORM DRAIN, Whittier Area, Proj. 532, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 8/25. CD 7/24/61.

▲ **Diversified Builders, Inc., and McDowell Co.,** P. O. Box 877, Paramount and 3750 Greenwood, San Diego 10, Calif., LB **$2,233,000,** est. $2,153,000, (5 bidders) BULK HANDLING FACILITY, 10th Ave. Terminal, SAN DIEGO, CALIF. City, Rm. 161, Civic Center Bldg., San Diego 1, Calif. BA 9/8. CD 8/15/61.

▲ **San Diego Constructors,** (M. H. Golden, Trepte Constr. Co., Gunther & Shirley Co., Hood Constr. Co., Ryan and Isbell, Esco Corp.), 3485 Noell St., San Diego 1, Calif., CA **$7,784,000** EFFLUENT OCEAN OUTFALL for Sewerage Sys., SAN DIEGO, CALIF. City, Rm. 161, Civic Center Bldg., San Diego 1, Calif. BA 8/18, CA 9/7. CD 8/22/61, under LB.

BUILDINGS—LB & CA

▲ **McKim-Kiser Co.,** Osburn, Idaho, LB **$750,680,** general contract STUDENT UNION ADDN., MOSCOW, IDAHO, University of Idaho, Moscow, Idaho. BA 9/6/61. CD 8/3/61.

Peck & Gale, 511 Washington St., Spokane, Wash., LB **$513,350,** mechanical contract, STUDENT UNION ADDN., (Moscow, Idaho).

J. C. Dillard Co., 70 Linden St., Reno, Nev., LB **$586,610** (5 bidders), 50,009 sq. ft., steel, reinf. steel, metal doors and frames, Churchill County Junior HIGH SCHOOL, FALLON, NEV. Churchill Co. School Dist., c/o Supt., 131 S. Main St., Fallon, Nev. BA 8/29/61. CD 8/24/61.

▲† **Raber-Kief, Inc., B-E-C-K Constructors & McLaughlin, Inc.,** 5939 4th Av. South, Seattle, Wash., LB **$9,046,200,** est. $7,818,057, CAPEHART HOUSING, ENG-62-5, FORT LEWIS, WASH. U. S. Eng., 1519 South Alaskan Way, Seattle 4, Wash. BA 9/7/61. CD 8/30/61.

Niti Romeri, 1902 Lassen St., Richland, Wash., Owner Builds, **$500,000,** 39 unit TWIN DOLPHINS APARTMENT, Van Giesen St., RICHLAND, WASH.

E. V. Shuck Constr. Co., 535 Pontius Ave. N., Seattle, Wash., CA **$657,000,** general contract five 81,587 sq. ft. masonry JUNIOR HIGH SCHOOL BLDGS., SEATTLE, WASH. Shoreline School Dist., 412 E. 158th St. and 15th Ave. NE, Seattle, Wash. BA 7/27/61. CD 8/3/61, under LB.

▲ **Boise Cascade Corp.,** 114 S. 10th St., Boise, Idaho, Owner Builds, **$1,500,000,** 120,000 sq. ft. PLYWOOD PLANT, YAKIMA, WASH.

▲ **Vieske & Pest,** 1440 13th St. S.E., Salem, Ore., CA **$1,074,900,** RETIREMENT HOME, CLEAR LAKE, ORE. Willamette Lutheran Home, Clear Lake, Ore. CA 8/31/61. CD 6/27/61, under LB.

Thompson & Georgesen, 1924 S.W. 6th Ave., Portland, Ore., LB **$405,056** (7 bidders), DORMITORY ADDNS., FOREST GROVE, ORE. Pacific University, Forest Grove, Ore. CD 3/16/61.

Tomler, Inc., 222 E. Manville, Compton, Calif., Owner Builds, **$750,000,** concrete tilt-up WAREHOUSE, 3370 E. Anaheim Rd., ANAHEIM, CALIF. John R. Anderson, 35 N. Raymond, Pasadena, Calif., archt.

Pickering Constr., 11518 Lambert, El Monte, Calif., CA **$912,500,** 76 stucco DWELLINGS, north of Olive at Merced, Tract 26009, BALDWIN PARK, CALIF. Monarc Estates, 932 San Bernardino Rd., El Monte, Calif.

▲ **Brattan Homes,** 1304 W. Commonwealth Ave., Fullerton, Calif., CA Est. **$1,063,260,** 62 stucco DWELLINGS, Tract 4133, BUENA PARK, CALIF. Miller Co., 1304 W. Commonwealth Ave., Fullerton, Calif. CA 9/1.

▲ **Brittain Contractors, Inc.,** 1304 W. Commonwealth, Fullerton, Calif., CA **$1,063,260,** 62 stucco DWELLINGS, Tract 4133 E. Valleyview between Orangethorpe and La Palma, BUENA PARK, CALIF. Miller Development Co., 1304 W. Commonwealth, Fullerton, Calif.

Southwest Engineering Co., 4800 S. Santa Fe Ave., Los Angeles, Calif., CA Est. **$500,000,** GASOLINE RECOVERY PLANT to serve off-shore properties, CARPINTERIA, CALIF. Standard Oil Co. of California, 605 W. Olympic Blvd., Los Angeles, Calif. CA 8/28.

▲ **Park Village,** Box 602, Anaheim, Calif., Owner Builds, **$1,649,113,** 113 stucco DWELLINGS, Tract 3682 and 3683, FULLERTON, CALIF.

Bregder Constr. Co., 2135 D. W. Ball Rd., Anaheim, Calif., CA **$993,000,** 12 APARTMENTS, Tract 3337, GARDEN GROVE, CALIF. Minkoff & Krause, 2180 Harbor Blvd., Anaheim, Calif.

Mil-Mar Constr. Co., 7891 Cerritos Ave., Stanton, Calif., LB **$876,350,** 21 APARTMENTS, Tract 3337, GARDEN GROVE, CALIF. Rom Investment Co., 2180 Harbor Blvd., Anaheim, Calif.

Ray Stark, 550 W. "H" St., Ontario, Calif., CA **$647,923**. Orangewood SCHOOL, Orangewood Ave. west of Euclid Ave., GARDEN GROVE, CALIF. Garden Grove School Dist., 11362 E. Stanford Ave., Garden Grove, Calif. BA 8/15, CA 8/30, CD 8/24/61, under LB.

▲ **H. C. Elliott, Inc.,** 268 San Lorenzo, Pomona, Calif., Owner Builds, **$1,083,800,** 65 stucco DWELLINGS, 10,141, Unit 1, GOLETA, CALIF.

Ernest W. Hahn, Inc., 219 S. Hawthorne Blvd., Hawthorne, Calif., CA **$705,000,** brick OFFICE, 1401 E. El Segundo Blvd., HAWTHORNE, CALIF. National Cash Register Co., 1401 E. El Segundo Blvd., Hawthorne, Calif.

Everet & Payton, 789 N. Olive, Ventura, Calif., CA **$505,777,** Proj. CAL 21-4, HOUSING DEVELOPMENT incl. 27 Bldgs., LOMPOC, CALIF. Santa Barbara Co. Housing Auth., 217 W. Maple St., Lompoc, Calif. Robt. I. Hoyt, 1115 Chapala St., Santa Barbara Calif., archt. BA 8/1.

▲ **James I. Barnes,** 1119 Montana Ave., Santa Monica, Calif., CA **$4,270,300,** est. $4,000,000, CHEMISTRY-GEOLOGY BLDG. ADDN., Step I, University of California, LOS ANGELES, CALIF. University California, at Los Angeles, 405 Hilgard Ave., Los Angeles, Calif. BA 8/8, CA 8/18. CD 8/15/61, under LB.

▲ **Crown Constr. Co.,** 5059 Pico Blvd., Los Angeles, Calif., LB **$3,596,223,** (7 bidders), RESIDENCE HALL No. 3, LOS ANGELES, CALIF. University of California at Los Angeles, 405 Hilgard Ave., Los Angeles, Calif. BA 9/7. CD 8/8/61.

J. A. McNeil Co., 3115 W. Mission Rd., Alhambra, Calif., LB **$611,000,** est. $1,000,000, (7 bidders), 3 story STUDENT HOUSING, W. 80 St., LOS ANGELES, CALIF. Loyola University, 7101 W. 80 St., Los Angeles, Calif. BA 8/29. CD 8/8/61.

▲ **S. Patti Constr. Co.,** 1340 Admiral Blvd., Kansas City, Mo., CA **$1,510,100,** est. $1,500,000, (7 bidders), MEDICAL CENTER PARKING UNIT 2, at University of California, LOS ANGELES, CALIF. University of California at Los Angeles, 405 Hilgard

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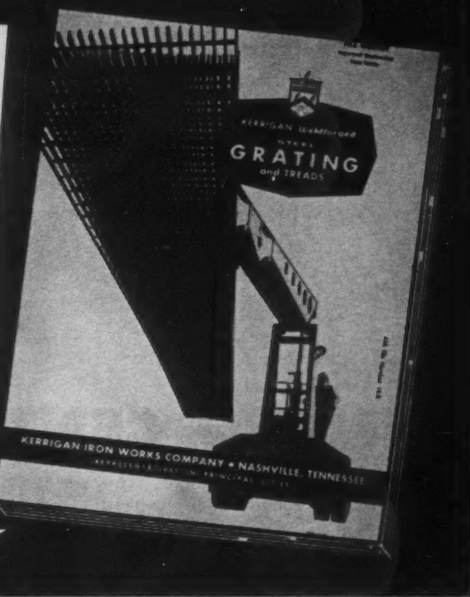

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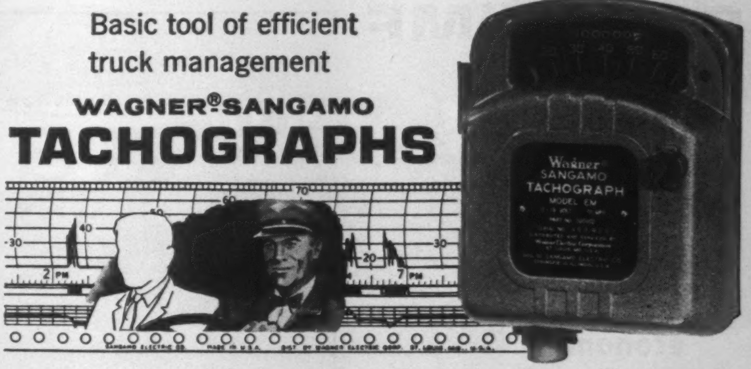

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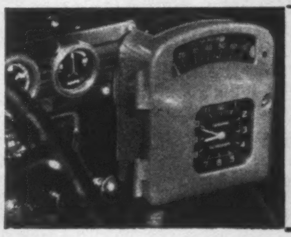

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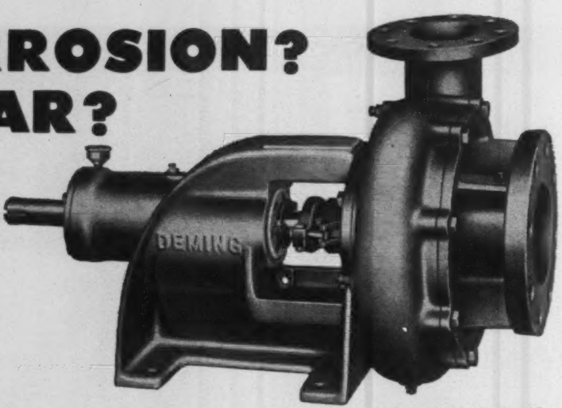

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CIRCLE 234 ON READER SERVICE CARD

Ave., Los Angeles, Calif. BA 8/3, CA 8/18. CD 7/5/61.

▲ **F. E. Young Constr. Co.,** 2141 Main St., San Diego, Calif., LB **$2,059,999,** est. $3,000,000, (12 bidders), Valley General SERVICE HEADQUARTERS, Van Nuys Proj. 7602, LOS ANGELES, CALIF. Los Angeles Dpt. Water & Power, 316 W. 3 St., Los Angeles, Calif. BA 8/23. CD 8/1/61.

▲ **Kaiser Refractories Div., Kaiser Engineering Co.,** Kaiser Center, Oakland, Calif., Owner Builds, **$1,625,000,** REFRACTORIES PRODUCTION PLANT, MOSS LANDING, CALIF.

▲ **A. L. Gindling Co.,** 6303 Wilshire Blvd., Los Angeles 48, Calif., CA **$1,023,000,** 93 stucco DWELLINGS, Del Sur Pl., Sherwood Way, Van Ness Ave., F, G & J Sts., Sonoma Way, Tracts 1118, 1119-1, 1119-4, OXNARD, CALIF. Drysdale, Bilson & Jericho Homes, Inc., 6303 Wilshire Blvd., Los Angeles 48, Calif.

▲ **Donald & McKee,** 414 E. Central Ave., Redlands, Calif., CA **$980,000,** est. $1,080,600, (8 bidders), PHYSICAL EDUCATION BLDG., PALM DESERT, CALIF. Coachella Valley Junior College Dist., 74723 Hy. 111, Palm Desert, Calif. Williams & Williams, 121 S. Palm Canyon Dr., Palm Springs, Calif., archts. BA 8/22, CA 8/25. CD 7/31/61;
Farrar-Griffin & Assoc., 24519 Hy. 99, San Bernardino, Calif., CA **$955,128,** est. $986,000, (8 bidders), CAMPUS CENTER, ADMINISTRATION and DINING HALL, (Palm Desert, Calif.).

Fosberg & Gregory, 12½ W. State St., Redlands, Calif., CA **$542,527,** steel frame with brick filler walls Good Hope ELEMENTARY SCHOOL, PERRIS, CALIF. Perris School Dist., 500 "A" St., Perris, Calif. Harry T. MacDonald, 3635 W. Slauson Ave., Los Angeles, Calif., archt. CA 8/30.

▲ **Williams & Burrows, Inc.,** 500 Harbor Blvd., Belmont, Calif., CA **$2,133,713,** steel frame, conc. aggreg. COUNTY OFFICE, incl. 4 story TOWER behind Hall of Justice, REDWOOD CITY, CALIF. San Mateo Co., County Courthouse, Redwood City, Calif. BA 8/15. CD 8/23/61, under LB.

Frank F. Jackson, P.O. Box 1637, La Jolla, Calif., CA Est. **$642,507,** 52 RESIDENCES, San Clemente Unit No. 1, SAN DIEGO, CALIF. J & C Development Co., P.O. Box 1637, La Jolla, Calif. L. C. Major & Assoc., 11015 South Paramount Blvd., Los Angeles, Calif., engrs.

▲ **H.R.H. Bldg. Corp.** 8857 Olympic Blvd., Beverly Hills, Calif., Owner Builds, **$1,103,700,** 63 stucco DWELLINGS, Tract 26051, Monogram, Gerald and Woodley Aves., SAN FERNANDO, CALIF.

▲ **Carl N. Swenson Co., Inc.,** P.O. Box 558, San Jose 6, Calif., CA **$1,861,000,** 4 story, 21,000 sq. ft. rein.-con. County WELFARE BLDG. at Civic Center, SAN JOSE, CALIF. Santa Clara Co. Welfare Dpt., County Courthouse, 20 W. Rosa St., San Jose, Calif. BA 8/24. CD 9/8/61, under LB.

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CIRCLE 59 ON READER SERVICE CARD

▲ **Del E. Webb Corp.**, 5101 San Fernando Rd., Los Angeles, Calif., CA Est. **$2,750,000**, 15 story Twin Tower APARTMENT-HOTEL, 3-level Subterranean Garage, SANTA MONICA, CALIF. Pacific Plaza Inc., 1431 Ocean Ave., Santa Monica, Calif. John C. Lindsay, 1528 3 St., Santa Monica, Calif., archt.

T. J. Constr. Co., 2904 W. Manchester Blvd., Inglewood, Calif., Owner Builds, **$711,500**, 35 stucco DWELLINGS, Benares Pl., Sully Dr., Lanark St., Tract 19991, SUN VALLEY, CALIF.

Harry Tancredi Co., 1106 E. 17 St., Santa Ana, Calif., CA **$919,566**, 43 DWELLINGS, Tract 4167, TUSTIN, CALIF. Metropolitan Savings & Loan, 818 Wilshire Blvd., Los Angeles, Calif.

MacLeod Constr. Co., 1538 San Nicholas St., Ventura, Calif., CA **$524,233**, est. $704,500, (9 bidders), ELEMENTARY SCHOOL (8 bldgs.), Kimball and Telegraph Rds., VENTURA, CALIF. Mound School Dist., Hill Rd., Ventura, Calif. BA 8/29. CD 8/8/61.

Marina Constructors, Inc., 2283 W. Lincoln Ave., Anaheim, Calif., CA **$869,000**, 65 DWELLINGS, Lassiter Dr., Cranmer Dr., Atterbury Dr., Tract 26586, WALNUT, CALIF. Walnut Partners, 2283 W. Lincoln Ave., Anaheim, Calif.

Cunningham Co., 10950 Dale St., Stanton, Calif., Owner Builds, **$965,124**,, 76 stucco DWELLINGS, Area of Brookhurst and Sugar, Tract 4063, WESTMINSTER, CALIF.

Pacific Builders, 414 Ward Ave., Honolulu, Hawaii, CA **$500,000**, First Unit of Pacific Gardens, Westside Gardens APARTMENT, HONOLULU, HAWAII. Pacific Gardens Inc., Theodore Char, pres., Rm. 301, Finance Factors Bldg., Honolulu, Hawaii.

CANADA

HEAVY CONSTRUCTION—BA

British Columbia — BA 9/29 — British Columbia Co., Ltd., 970 Burrard St., Vancouver, 500 ft. suspension-type BRIDGE over Peace River near Hudsons Hope. $250,000.

HEAVY CONSTRUCTION—LB & CA

Malac Roofing & Flooring Ltd., 4449 Tecumseh St. East, Windsor, Ont., LB **$119,703**, RE-ROOFING HANGARS, Royal Canadian Air Force Station, NORTH BAY, ONT. Defence Construction (1951) Ltd., 56 Lyon St., Ottawa, Ont.

Heeringa Brothers, 52 Wardrope Ave. S., Stoney Creek, Ont., CA **$137,800**, (5 bidders), ARENA and COMMUNITY CENTER, Green and Bricker Sts., PORT ELGIN, ONT. Town of Port Elgin, Port Elgin, Ont. Philips & Roberts Ltd., 593 Brant St., Burlington, Ont., engrs.

QUEBEC—Dpt. P. Wks., Parliament Bldgs., Quebec City, BRIDGES,

Que.—**Sud Ltee**, 1160 Belvedere St., Quebec City, Que., LB **$184,418**, (12 bidders), rein.-con. bridge over River Jacques Cartier, Ste. Catherine de Portneuf (Gouin Bridge), Ste. Catherine, CD 6/22/60;

Que.—J. M. **Boucher**, Bic, Que., LB **$99,225**, (2 bidders), rein.-con. bridge over Rimouski River, Canton Duquesne Rimouski Co.;

Que.—**Lepinay, Inc.**, 205 Rte. de l'Eglise, Quebec City, Que., LB **$252,273**, (13 bidders), rein.-con. bridge over St. Marguerite River (east branch), Sacre Coeur, Saguenay.

Budd Steel Co. of Canada Ltd., 5775 Victoria Ave., Montreal, Que., LB **$443,646**, supply 3,465 tons REINFORCED STEEL BARS for Hydro Carillon project, CARILLOU, QUE. Quebec Hydro Electric Comn., 10y Craig St. W., Montreal, Que.

Roland Laureault, 759-6th Ave., Pointe aux Trembles, Que., CA **$309,800**, FILTRATION PLANT, St. Ignace St., LAPRAIRIE, QUE. Ville de Laprairie, St. Ignace St., Laprairie, Que. J. Richard Lessard, 6786 de Lorimier Ave., Montreal, Que., engr. BA 8/7/61. CD 2/18/57.

Miron et Freres Ltee, 2201 Jarry St., Ville St. Michel (Montreal) Que., CA **$618,892**, (4 bidders), roadways, Sects. 2 and 3, CHAMPLAIN BRIDGE, over Nun's Island, MONTREAL, QUE. National Harbors Bd., Hunter Bldg., Ottawa, Ont. BA 8/10/61. CD 8/18/61, under LB.

Patrick Constr. Co., Ltd., 311 Ave. M South, Saskatoon, Sask., CA **$947,480**, SEWAGE DISPOSAL SYSTEM, 1 tank collector sewer, 1 sewage pumping station, lagoon, force line, four lagoons and misc. work, MOOSE JAW, SASK. City, City Hall, Moose Jaw, Sask. CD 9/5/61, under LB.

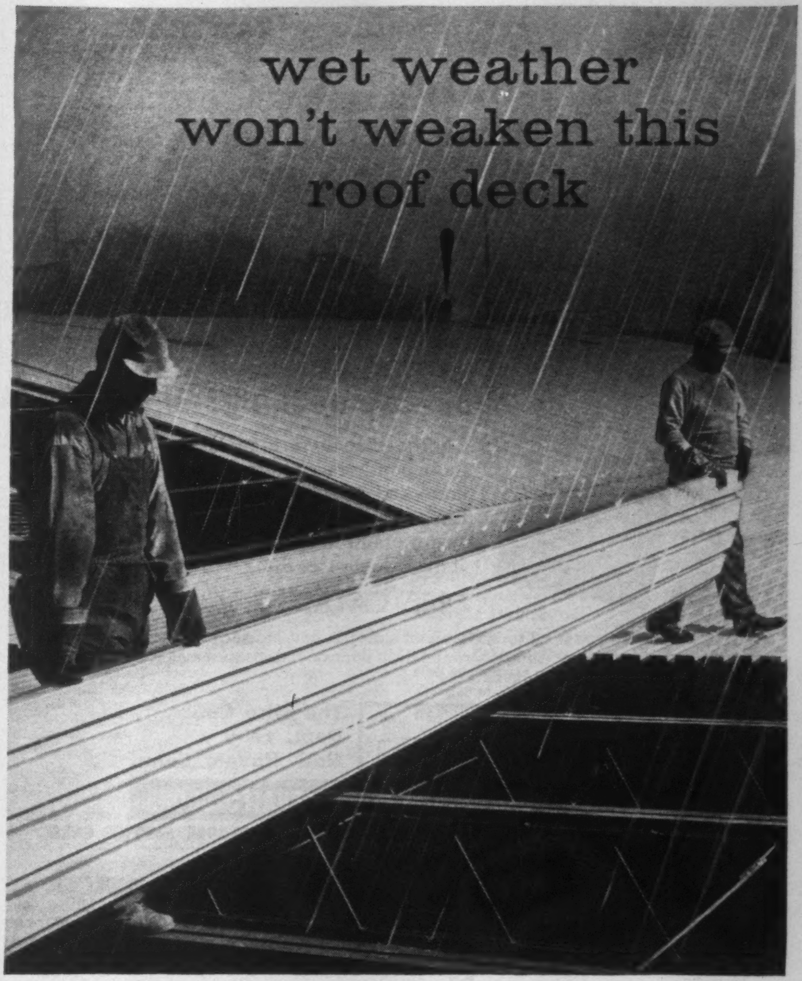
BUILDINGS—LB & CA

Beaver Constr. Co., Ltd., 175 W. 5th Ave., Vancouver, B. C., CA **$942,667**, rein.-con., steel, wood frame, SCHOOL, 12th and Union Sts., WEST VANCOUVER, B. C. School Dist. No. 45, West Vancouver, B. C. Thompson, Berwick & Pratt, 1553 Robson St., Vancouver, B. C., archts. CD 2/20/61.

Winnipeg Constr. Co., Ltd., 1578 Erin St., Winnipeg, Man., CA **$641,995**, steel, concrete PHARMACY, University of Manitoba, FORT GARRY, MAN. Manitoba Govt., Parliament Bldgs., Winnipeg, Man. BA 7/20/61. CD 9/5/61, under LB.

▲ **Ellis-Don Ltd.**, Oxford St., London, Ont., CA **$1,355,-580**, (9 bidders), 4 and 5 story, two HOSPITAL ADDNS., brick, rein.-con. roof, STRATFORD, ONT. Stratford General Hospital, Stratford, Ont. BA 8/21/61. CD 8/16/61.

Semeteys Constr., Inc., 113 Cartier St., Pointe Claire, Que., LB **$485,000**, ELEMENTARY SCHOOL, 101st Ave., CHOMEDY, QUE. Protestant School Bd. of Greater St. Martin, 1125 Elisabeth Blvd., St. Martin, Chomedy, Que. BA 8/31/61. CD 8/14/61.



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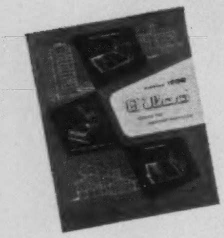

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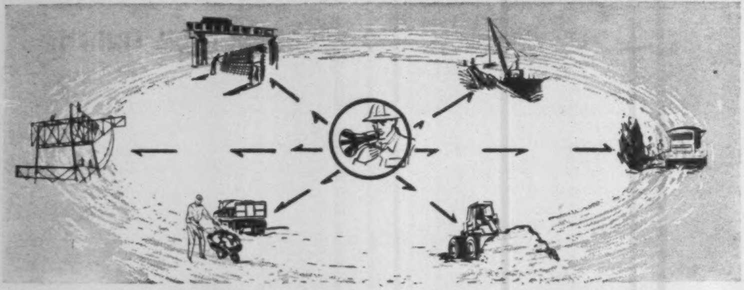

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Duroc Constr., Inc., 210 Cremazie Blvd. W., Montreal, Que., LB **$728,954**, (15 bidders), ELEMENTARY SCHOOL, LAVAL DES RAPIDES, QUE. School Bd. of Laval des Rapides, Laval Des Rapides, Que. Jean Damphouse, 408 des Prairies Blvd., Laval des Rapides, Que., archt. BA 8/31/61. CD 8/21/61.

▲ **Golconda Builders Corp.**, 155 Port Royal Ave., Montreal, Que., Owner Builds, **$2,000,000**, 20 story BANK and OFFICE, steel, concrete, curtain wall, exterior glass, aluminum and marble, air-conditioning, Dorchester Blvd. W., east of Crescent St., MONTREAL, QUE. Fish & Melamed, 4147 Sherbrooke St. W., Montreal, Que., archts. Eskenazie, Leobenberg, Slone, Berstein, 6819 Decarie Blvd., Montreal, Que., engrs.

U. S. POSSESSIONS

BUILDINGS—LB & CA

† **W. B. Uhlhorn**, P.O. Box 2028, Harlingen, Tex., LB **$927,880**, est. $1,000,000, precast stone or concrete block, replacement non-U.S. citizens QUARTERS, Pedro Meguel, Ser. No. 62-1, CANAL ZONE. Panama Canal Co., Procurement Div., New Orleans Army Terminal, New Orleans, La. BA 9/1. CD 8/8/61.

AMERICANS ABROAD

HEAVY CONSTRUCTION—LB & CA

▲ **Hawaiian Dredging & Constr. Co.**, 1350 Ala Moana Blvd., Honolulu, Hawaii CA **$5,500,000**, RECLAMATION 18 klms. SHORELINE, incl. 3,000 ft. filled area, out into the bay, 25,000,000 cu. yd. fill will be excavated along the bay from Pasay City to Cavite, Minila, REPUBLIC OF PHILIPPINES. Republic of Philippines, Quezon City (Luzon), Philippines. CD 4/29/59.

LATIN AMERICA

HEAVY CONSTRUCTION—BA

▲ **Peru, Lima**—BA 1/31/62—Motor-Columbus Ltd., consult. engrs., Parkstrasse 27, Baden, Switzerland 9 km. (5.6 mi.) oil filled 220 kv. HV CABLE, single phase, 230-250 amps. for Power Transformers, Huinco Power Development for Lima Light & Power Co., Lima. CD 7/19/60.

FOREIGN

BUILDINGS—BA

▲ **Singapore**—BA 10/10—Housing & Development Bd. Princess House, Queenstown, Singapore, two 10 story and one 20 story low-cost HOUSING, 542 units, 2 story FLATS and SHOPS, SUB-STATION, SANITARY SEWERS, WATER LINES, Selegie Rd. and Short St. Plans deposit $165.

For additional reports see CONSTRUCTION DAILY REPORTS SECTION

PROPOSED PROJECTS

WATER SUPPLY

▲ **Alaska, Fairbanks**—City, City Hall, bond election Oct. 3,
2 m.g. WATER TREATMENT PLANT, **$1,800,000;**
WATER LINES to Slaterville, **$630,000;**
East Weeks Field, **$114,000;**
Railroad Industrial Area, **$238,000;**
Mooreland Acres-Taku Area, **$1,361,000;**
West Weeks Field, **$174,000;**
South Fairbanks. **$878,000.** CD 9/29/60.

▲ **N. Y., Hamburg**—Town of Hamburg, 501 South Park Ave., WATER TREATMENT PLANT incl. 1,800 ft. outfall lines in Lake Erie. **$3,000,000-$3,500,000.** (Correction—Cherry & Preble, 87 West Tupper St., Buffalo, N. Y., are not consult. engrs on this project). CD 7/31/61.

▲ **Wash., Richland**—City, City Hall, DRILLING ADDITIONAL WELL, CONSTR. 10 m.g. RESERVOIR, CONSTR. INTAKE and PUMP STATION on Columbia River and CONSTR. 15 m.g. TREATMENT PLANT. **$2,141,000.** Cornell, Howland, Hayes & Merryfield, 1600 Western Ave., Corvallis, Ore., consult. engrs.

SEWERS, WASTE DISPOSAL

▲ **Ariz., Phoenix**—City Dpt. P. Wks., City Hall, 15-33 in. SANITARY SEWER TRUNK LINES, 43rd Ave. Northern to Sweetwater Aves., Peoria Ave. from 43 to 35th Aves., Sweetwater Ave. from 43rd to 23rd Aves., Proj. S-61123(BI), **$700,000**, Maddock & Assoc. Engineers, Inc., 4900 E. Industrial School Rd., consult. engrs.; 4.5 mi. SANITARY SEWER NO. S-61119(BI) from 91st Ave. sewage plant to 59th Ave. and Broadway, **$1,882,000**, Yost & Gardner, 112 N. Central Ave., consult. engrs.; 5.5 mi. sanitary sewer from 23rd Ave. SEWAGE TREATMENT PLANT to 59th Ave. and Broadway, Proj. No. S-61120(BI), **$2,000,000.** CD 6/1/61.

▲ **Ind., Michigan City**—City, City Hall, SANITARY and STORM SEWERS, **$2,340,000.**

▲ **La., New Orleans**—Sewerage & Water Bd., 1300 Perdido St., DRAINAGE SYS. **$11,450,000.** SEWAGE TREATMENT PLANT, sewerage sys. exten. East Bank, Mississippi River. **$14,525,520.** SEWERAGE SYS. West Bank, Mississippi River. **$4,398,800.** To go ahead 1962.

▲ **Massachusetts** — Commonwealth Mass., Metropolitan Dist. Comn., Constr. Div., 20 Somerset St., Boston, Contr. C214, Boston Main DRAINAGE RELIEF SEWER,

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Metropolitan Sewerage Dist., Roxbury. **$1,800,000.** Bids soon.

▲ **Mich., Detroit**—Wayne Co. Dpt. P. Wks., Wayne County Rd. Comn., 278 City-County Bldg., Zone 26, Rouge Valley SEWAGE DISPOSAL PLANT, sanitary and storm sewers, Detroit, Dearborn, Melvindale, Redford, Livonia, First Stage, 4 mi. Section, Detroit, Dearborn, Melvindale to start about Dec. 1, 1961. **$16,815,000.**

N. Y., Oyster Bay—Town, Town Hall, Audrey Ave., reconstr. SEWAGE PLANT, Bay St. and constr. SECONDARY SEWAGE PLANT at site. **$750,000.**

▲ **O., Xenia**—Greene Co. Comnrs., Courthouse, SEWERAGE SYSTEM, Greater Knollwood Area, Beavercreek Township, **$4,570,244.** Ralph H. Woolpert Co., 360 W. 1st St., Dayton, consult. engr. CD 5/19/61.

▲ **Okla., Oklahoma City**—City, City Hall, **$7,000,000** bond election Oct. 24, SANITARY SEWERS; **$1,000,000** bond election Oct. 24, STORM SEWERS. (Amount of bonds reduced.) CD 8/22/61.

STREETS AND ROADS

▲ **Wash., Seattle**—City, County-City Bldg., will not GRADE LINDEN AVE. and adjacent streets, **$1,275,326.** Project abandoned. CD 6/23/61.

EARTHWORK, WATERWAYS

▲ **Ind., Franklin**—City Bd. P. Wks., City Hall, DRAINAGE, Phase 1-divert Hurrican Creek north to city's industrial park along U. S. 31, to prevent flooding of north and east sides; 1,200 ft. levee south of city along U. S. 31, **$1,000,000;** Phase 2-divert Young's Creek around west side, remove New York Central R.R. bridge, enlarge sanitary sewers, in north side, **$500,000.** BA 1962.

AIRPORTS

† **Calif., Lemoore**—12th Naval Dist. P. Wks., San Bruno AIR BASE constr., Naval Air Station. **$900,000.** (appropriated). CD 7/22/60.

▲† **Calif., Miramar**—11th Naval Dist., 1220 Pacific Hy., San Diego, AIR BASE CONSTR., Naval Air Station. **$1,139,000** (appropriated). CD 8/27/56.

▲† **Calif., Point Mugu**—11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego, Zone 1, MISSILE LAUNCH FACILITIES, Pacific Missile Range. **$2,600,000.** (appropriated).

† **Fla., Mayport**—Dist. P. Wks. Office, Sixth Naval Dist., Bldg. 13, U. S. Naval Base, Charleston, S. C. OPERATIONAL FACILITIES, U. S. Naval Air Station, **$750,000,** (appro.). CD 9/6/58.

▲ **Iowa, Des Moines**—City of Des Moines, Municipal Airport, 1,500 ft. AIR RUNWAY extended and 1,000 ft. overrun constr. **$1,000,000.** CD 3/4/57.

▲ **Mo., St. Louis County**—Paul D. Haglin, c/o Haglin & Co., 111 S. Bemiston Ave., Clayton, Zone 5, Spirit of St. Louis AIRPORT, 5,100 ft. runway, cross-wind runway, 60x125 ft. terminal, 1037-acre site, Airport-Industrial Park, off Daniel Boone Expressway. **$7,955,450.** Bids grading Fall 1961.

† **Nev., Fallon**—P. Wks. Officer, 12th Naval Dist., San Bruno, Calif., WEAPONS TRAINING FACILITIES, Naval Air Station, **$750,000.** CD 8/23/60.

▲† **N. J., Lakehurst**—Fourth Naval Dist., Naval Base, Phila., Pa., RUNWAY EXTENSION, Catapult and Arresting Barrier, Naval Air Training Facility. **$1,500,000.** (appropriated). CD 4/17/61.

▲† **N. C., Cherry Point**—Dist. P. Wks., Office, Fifth Naval Dist., Marine Corps Air Station, Norfolk, Va., AIR STATION CONSTR. Marine Corps Air Station, **$4,350,000** (appropriated). CD 8/1/60.

▲† **N. C., Jacksonville**—Dist. P. Wks. Office, Fifth Naval Dist., Naval Base, Norfolk, Va., AIR STATION CONSTR. Marine Corps Air Station, New River, **$2,500,000.** (appropriated).

Okla., Oklahoma City—Oklahoma City Airport, Trust First National Bank Bldg., Zone 2, plans by Hudgins Thompson & Ball, 1411 Classen, APARTMENT AND MOTEL, F A A Center to serve Will Rogers Airport. **$750,000.** CD 12/24/57.

▲† **Utah, Hill Air Force Base**—U. S. Eng., 180 New Montgomery St., San Francisco, Calif., 300 unit FAMILY HOUSING. **$5,190,000.** (appropriated).

UNCLASSIFIED

† **Calif., Long Beach**—11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego, Zone 32, PIER UTILITIES, Naval Station. **$720,000** (appropriated). CD 9/18/57.

▲† **N. C., Camp Lejeune**—Dist. P. Wks. Office, Fifth Naval Dist., Marine Corps Base, Norfolk 11, Va., OPERATIONAL FACILITIES, Marine Corps Base. **$1,400,000** (appropriated).

▲ **B. C., Vancouver**—City, City Hall, COMMUNITY CENTRE, incl. swim pool at John Hendry Park, Trout Lake, **$600,000;** community centre for Renfrew Park, incl. covered skating rink, **$600,000;** plans by Mercer & Mercer, 675 West Hastings, community centre for South Vancouver, incl. skating rink, indoor swim pool, gymnasium with courtyards bet. bldgs., **$700,000.** Thorson-Thorson, 1700 W. Georgia St., struct. engrs. Sandwell Ltd., 1500 Alberni St., mech. engrs. Lennox R. MacKenzie, 355 Burrard St., electrical engr. CD 6/27/45.

PUBLIC BUILDINGS

▲ **Alaska, Fairbanks**—City, City Hall **$10,000,000** bond election Oct. 3, ELECTRICAL GENERATING FACILITIES.

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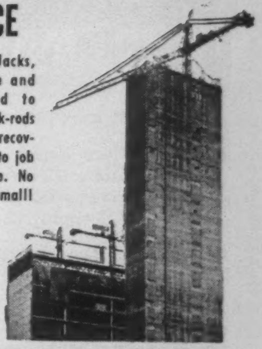

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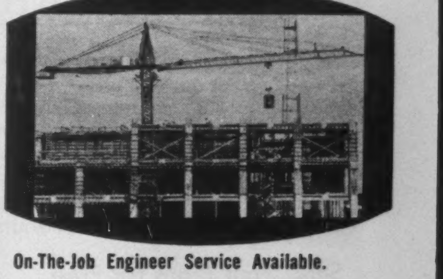

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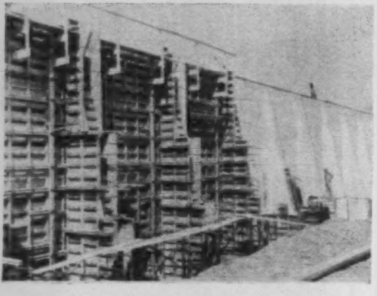

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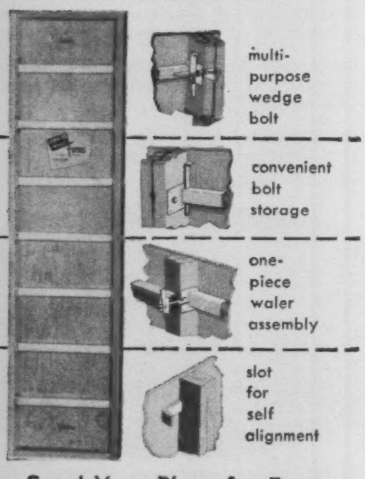

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Rockford (Loves Park) Illinois

CIRCLE 238 ON READER SERVICE CARD

▲ **Calif., Chino**—State Div. Architecture, 1120 N St., Sacramento, Chino INSTITUTE for Men ADDN. **$2,590,000.** Bids probably in next few months. CD 12/4/58.

▲† **Calif., Inyokern**—11th Naval Dist., 1220 Pacific Hy., San Diego, Zone 32, RESEARCH BUILDINGS, Naval Ordnance Test Station, China Lake. **$1,000,000.** (Appropriated). CD 8/28/56.

▲† **Calif., Twentynine Palms**—11th Naval Dist. P. Wks., 1220 Pacific Hy., San Diego Zone 1, HOSPITAL ADDN., Marine Corps Base. **$1,100,000.** (Appropriated).

▲† **Calif., Vallejo**—12th Naval Dist. P. Wks., San Bruno, ALTERING BUILDINGS for Fleet Ballistic Missile Training Program, Naval Schools, Command, Mare Island. **$2,100,000.** (Appropriated).

▲ **Colo., Denver**—Denver Housing Auth., 1449 Navajo, plans by Miles Lantz & Co., 2360 E. 3rd Ave., 150 units Public HOUSING PROJECTS. **$1,750,000;** plans by Tician Papachristou, 847 17th Ave., 100 units Public HOUSING PROJECT, **$1,200,000.**

▲ **Del., Dover**—State of Delaware, Old State House, OFFICE BLDG. for State Departments, **$2,000,000;** LEGISLATIVE OFFICE BLDG., **$2,000,000.**

▲ **D. C., Wash.**—D. C. Govt. Bldgs. & Grounds, 499 Pennsylvania Ave., NW,
Consolidated Vocational HIGH SCHOOL for Girls, 6th and Brentwood Parkway, NE, **$4,500,000** (no approp.).
Garrison Elementary School replacement, 12th St. between R and S Sts., NW, **$1,120,000.**
Hine Junior High School replacement, 7th & C Sts., SE **$3,040,000** (no approp.).
Nalle Elementary School Addn., 50th and C Sts., SE **$465,000** (no approp.).
Seaton Elementary School replacement "I" between 2nd and 3rd Sts., NW, **$1,320,000.**
Smothers Elementary School Addn., 44th and Brooks St., NE, **$460,000** (no approp.).
D. C. Teachers College, 13th & Upshur Sts., NW, **$7,000,000** (no approp.).
Junior High School, 1st and Channing Sts., NW, **$3,000,000** (no approp.).
Junior High School, Alabama Ave. and Congress St., SE, **$2,800,000** (no approp.).
Junior High School, New Hampshire Ave. and Hamilton St., NW, **$2,800,000** (no approp.).
Junior High School, Trinidad Ave. and Neal St., SE, **$2,915,000** (no approp.).
Elementary School, 17th and E Sts., NE, **$1,200,000** (no approp.).
Elementary School, 20th and M Sts., NE, **$1,000,000** (no approp.).
Elementary School, 47th and Blaine Sts., NE, **$1,100,000** (no approp.).
Administration Bldg., Board of Education, 13th & K Sts., NW, **$4,000,000** (no approp.).

Fla., Fort Myers—Lee County School Bd., Courthouse, plans by McBryde & Frizzell, 2120 McGregor Blvd., JUNIOR COUNTY HIGH SCHOOL, Cypress Lake, **$715,000.** CD 8/30/61.

▲ **Ga., Athens**—Bd. Regents, University System of Georgia, 244 Washington St. SW, Atlanta, plans by Logan & Williams, Palmer Bldg., Atlanta, DORMITORY-DINING HALL, University of Georgia. **$3,000,000.** Armstrong & Edwards, 26 Peachtree Place NW, Atlanta, struct. engrs. CD 3/29/61.

▲† **Idaho**—Arco-Atomic Energy Comn., Idaho Operations .Office, Idaho Falls, low cost propulsion and electric POWER GENERATOR National Reactor Testing Station, **$8,000,000.** Kaiser Engineers, Kaiser Center, 1924 Bway., Oakland 12, Calif., engrs. CD 6/15/60.

▲ **Ill., Centralia**—State Pub. Welfare, State Office Bldg., Springfield, plans by Lankton, Ziegele, Terry & Assocs., 1100 Main St., Peoria, 750 bed MENTALLY RETARDED HOSPITAL, **$11,500,000.** CD 8/10/60.

▲† **Ill., Great Lakes**—Dist. P. Wks. Officer, Ninth Naval Dist., Bldg. 1A, OPERATIONAL FACILITIES, Naval Training Center. **$2,500,000.**

▲ **Ill., Joliet**—Housing Auth. of Joliet, 367 South Desplaines St., plans by Kruegel, Healy & Moore, 4 East Clinton St., 14 story, 139-units, brick, glass SENIOR CITIZEN HOUSING PROJECT, Ottawa St. and Crowley Ave. **$2,000,000.** Bids in Spring. CD 8/22/56.

▲ **Ill., Pontiac**—Pontiac Twp. High School, Pontiac, bond election Oct. 28, HIGH SCHOOL. **$2,000,000.** Bonds June 27 defeated. CD 6/8/61.

▲† **La., New Orleans**—National Aeronautics & Space Admin., Marshall Space Flight Center, Huntsville, Ala., ALTERING 8 PLANTS to produce Saturn engine, EXTENDING RUNWAY, Old Gentilly Hy., Michoud. **$3,000,000** ($15,000,000 with equipment).

▲† **Md., Annapolis**—Area P. Wks. Office, Chesapeake, Naval Weapons Plant, Wash., D. C., rehabilitation BANCROFT HALL, Naval Academy. **$7,500,000.** (Appropriated). CD 6/10/60.

▲ **Mass., Lawrence**—City Housing Auth., 90 Broadway, plans by Thomas J. Pearson Assoc., 351 Essex St., Lawrence, Mass., 208 addnl. HOUSING units. **$1,000,000.** Bids early 1962.

▲ **Minn., Benson**—Bd. Educ. Independent School Dist. No. 777, plans by Matson & Wegleitner, 3701 Wayzata Blvd., Minneapolis, 1 story HIGH SCHOOL. **$1,000,000.**

▲ **Minn., Brooklyn Park (P.O. Minneapolis)**—Bd. Educ. Independent School Dist. No. 279, voted **$3,000,000** bonds Aug. 21, JUNIOR HIGH SCHOOL and two ELEMENTARY SCHOOLS. Matson & Wegleitner, 3701 Wayzata Blvd., Minneapolis, Minn., archts. CD 6/16/61.

Minn., Spring Valley—Bd. Educ. Independent School Dist. No. 237, $800,000 bond election Sept. 29, ELEMENTARY SCHOOL. **$700,000.** Matson & Wegleitner, 3701 Wayzata Blvd., Minneapolis, archts.

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CIRCLE 57 ON READER SERVICE CARD

▲ **Miss., Vicksburg**—City Housing Auth., City Hall, 350 unit low-rental HOUSING. **$2,901,850.**

Mont., Bozeman—City, City Hall, defeated **$781,928** bonds Aug. 29, CITY HALL. CD 7/7/61.

N. J., Bayville—Berkeley Twp. Bd. Educ., Atlantic Blvd., referendum bonds and project Sept. 29, ELEMENTARY SCHOOL off Rte. 9 and Central Blvd. **$725,000.** Norman Coates, Auten Rd., R.D. 1, Somerville, N. J., archt. CD 4/14/61.

▲ **N. J., Belleville**—Bd. Educ. Town of Belleville, 183 Union Ave., referendum bonds and project Oct. 17, HIGH SCHOOL. **$2,750,000.** Alfonso Alvarez, 204 Bellevue Ave., Upper Montclair, archt. CD 7/14/61.

▲ **N. J., Carteret**—Housing Auth., Borough of Carteret, Cooke Ave., plans by Murray Leibowitz, 214 Smith St., Perth Amboy, 200-unit HOUSING, Mercer and Essex Sts. **$3,000,000.** CD 6/20/61.

N. J., Denville—Bd. Educ. Denville Twp., Openak Rd., referendum bonds and project Oct. 17, upper ELEMENTARY SCHOOL, Diamond Spring Rd. **$993,000.** Micklewright & Mountford, E. Stuyvesant St., Trenton, N. J., archts. CD 5/19/61.

▲ **N. J., Newark**—Bd. Freeholders Essex Co., Courthouse, COUNTY BLDG. Over **$1,000,000.**

N. J., Pompton Plains—Bd. Educ. Pequannock Twp., Pequannock School, Pequannock Valley Rd., cancelled referendum Sept. 26, Pequannock SCHOOL ADDN. **$800,000.** Frederick Elsasser, 2013 Morris Ave., Union, N. J., archt. CD 3/22/61.

▲ **N. J., Scotch Plains**—Bd. Educ., Township Scotch Plains, 1800 E. 2nd St., cancelled referendum Sept. 28, HIGH SCHOOL, Terrill Rd. **$2,000,000.** CD 8/25/61.

▲ **N. Y., East Meadow**—Nassau Co., Old County Court House, Franklin Ave., Mineola, N. Y., plans by Richard Heidelberger & Assocs., 658 Fulton Ave., Hempstead, N. Y., electronic cancer TREATMENT BLDG., Meadowbrook Hospital. **$3,264,000.** CD 11/23/60.

▲ **N. Y., Syracuse**—Bd. Educ., 400 W. Genessee St., plans by Pederson, Hueber & Hares, Syra Kemper Bldg., Syracuse, N. Y., SENIOR HIGH SCHOOL. **$4,450,000.** Bids Apr. 1962. CD 8/9/59.

▲ **N. C., Raleigh**—North Carolina Dpt. Educ., Education Bldg., plans by L. N. Boney, 120 S. 5th St., Wilmington, 10 story DORMITORY, State College, **$2,000,000.** CD 12/1/59.

▲ **N. C., Raleigh**—North Carolina Prison Comn., W. Morgan St., plans by Holloway & Reeves 714 St. Marys St., PRISON HOSPITAL. **$1,100,000.** Booth, Jones & Assocs., Essex Circle, Raleigh, N. C., elect. engrs. CD 8/31/61.

▲† **N. D., Minot**—U. S. Eng., 6012 US Post Office & Courthouse, Omaha. Neb., 300 unit FAMILY HOUSING, **$5,190,000** (appropriated).

▲ **O., Lorain**—Lorain Metropolitan Housing Authority, 100 low rent income HOUSING UNITS, Oberlin. **$1,500,000.**

▲† **Okla., Fort Sill**—U. S. Eng., Box 61, Tulsa, 200 unit FAMILY HOUSING, **$3,460,000** appropriated).

▲ **Okla., Norman**—University of Oklahoma, Bd. Regents, State Capitol Bldg., Oklahoma City, POWER PLANT EXTENSION. **$2,750,000.** Coston Frankfurt & Short, 323 East Madison, Oklahoma City, consult. engrs. CD 10/23/58.

▲ **R. I., Howard**—State R. I. & Prov. Plants, Div. Purchase, State House, Providence, plans by Chiaverini & Carione, 49 Westminster St., Providence, BOY'S TRAINING SCHOOL, **$1,930,000.** Bids October 1961. CD 3/8/61.

▲† **S. C., Charleston**—Dist. P. Wks. Officer, Sixth Naval Dist., Bldg. 13, U. S. Naval Base, 200 units FAMILY HOUSING, Naval Base. **$3,460,000.**

▲ **S. D., Rapid City**—City, City Hall, **$1,500,000,** bond election Sept. 26, CITY AUDITORIUM. Harold Spitznagel & Associates, and Craig Brooks & Assocs., 1800 S. Summit, Sioux Falls, archts. Bids late fall. CD 3/9/56.

▲ **Va., Manassas**—Bd. Educ. Prince William County, Manassas, plans by Hayes, Seay, Mattern & Mattern, 1707 H St. N.W., Wash., D. C., Manassas HIGH School. **$1,000,000.** CD 2/12/60.

† **Va., Norfolk**—Fifth Naval Dist., U. S. Naval Station, Norfolk, BUILDINGS, Armed Forces Staff College. **$800,000** (Appropriated). CD 4/15/58.

▲ **Wash., Seattle**—University of Washington, Zone 5, plans by McClure and Adhison, Sherwood Bldg., Spokane, Roberts HALL ADDN. **$1,500,000.** Construction in 1962. CD 11/5/61.

Wis., Darlington—Bd. Educ., Darlington, plans by G. A. Johnson, 501 7th St., Rockford, Ill., 73,000 sq. ft. HIGH SCHOOL. **$850,000.**

▲ **Wis., Kenosha**—Bd. Educ., 5515 Sheridan Rd., plans by John J. Flad & Assocs., 2525 University Ave., Madison, Tremper HIGH SCHOOL. **$4,500,000.**

B. C., Vancouver—City, City Hall, plans by McCarter Nairne & Partners, 355 Burrard, Vancouver public AQUARIUM WING, Stanley Park, incl. science hall, salmon spawning stream, pool for porpoises. **$750,000.** D. W. Thomson & Co., 1690 W. Broadway, consult. engrs.

▲ **Newfoundland, Bell Island**—Province of Newfoundland, Parliament Bldgs., St. John's, TECHNICAL SCHOOL, **$1,400,000.** Bids soon.

▲ **Newfoundland, Burin Peninsula**—Province of Newfoundland, TECHNICAL SCHOOL, **$1,250,000.** Bids soon.

Newfoundland, Carbonear—Province of Newfoundland, Parliament Bldg., St. John's TECHNICAL SCHOOL, **$875,000.** Bids soon.

▲ **Newfoundland, Corner Brook**—Province of Newfoundland, Parliament Bldgs., St. John's, TECHNICAL SCHOOL, **$2,250,000.** Bids soon.

▲ **Newfoundland, Gander**—Province of Newfoundland, Parliament Bldgs., St. John's, TECHNICAL SCHOOL, **$1,500,000.** Bids soon.

Newfoundland, Lewisporte—Province of Newfoundland, Parliament Bldgs., St. John's TECHNICAL SCHOOL, **$875,000.** Bids soon.

Newfoundland, Port Aux Basque—Province of Newfoundland, Parliament Bldgs., St. John's, TECHNICAL SCHOOL, **$875,000.** Bids soon.

▲ **Newfoundland, Stephenville Crossing**—Province of Newfoundland, Parliament Bldgs., St. John's, TECHNICAL SCHOOL, **$1,000,000.** Bids soon.

Ont., Madoc—Centre Hastings Dist. High School Area Bd., Madoc, plans by S. B. Coon & Son, 745 Mount Pleasant Rd., Toronto, HIGH SCHOOL ADDN. **$750,000.**

▲ **Ont., Port Credit**—South Peel Bd. Educ., Windy, Oaks Drive, composite SCHOOL, near Hy. 10 and Queen Elizabeth Way. **$1,750,000.**

▲ **Ont., Woodstock**—Woodstock High School Bd., plans by Blackwell Hagarty & Buist, 310 Princess Ave., London, 1 story, part 2 story, brick, steel, precast conc., TECHNICAL SCHOOL. **$1,300,000.**

COMMERCIAL BUILDINGS

▲ **Calif., Victorville**—California Interstate Telephone Co., San Bernardino, plans by Risley & Gould, 2502 W. 3 St., Los Angeles, Zone 57, five HEADQUARTERS BLDGS., heliport. **$2,500,000.**

▲ **Colo., Denver**—Owner, c/o Ramsey & Reeves, archts., 882 A. Kipan, 8 story MEIDCAL OFFICE, 50,000 sq. ft. off-street parking, **$3,500,000.**

▲ **Colo., Denver**—Title Guaranty Co., 1711 California St., plans by Ralph D. Peterson & Assocs., 1750 Humboldt, 5 story, 35,000 sq. ft. OFFICE, 1738 California St. **$1,000,000.**

▲ **Conn., Madison**—Wm. C. Woods, Hickory Lane, North Madison, 125 HOUSES, Run Acre Farms, **$1,250,000.**

Conn., Middletown—T. Bowl, Inc., Washington St., Shopping Plaza, BOWLING ALLEY, Washington St. Shopping Plaza, **$750,000.**

▲ **Fla., Tampa**—First Federal Savings & Loan Assocs., 408 Franklin St., plans by Harry A. MacEwen, 207 East Davis Bldg., 11 story, CB-S air conditioned BANK and OFFICE, Franklin and Madison Sts. **$3,000,000.** Bids Mid-1962.

▲ **Ill., Chicago**—John J. Mack & Raymond Sher, 201 East Walton St., rehabilitate Sherman HOTEL, incl.

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CIRCLE 239 ON READER SERVICE CARD

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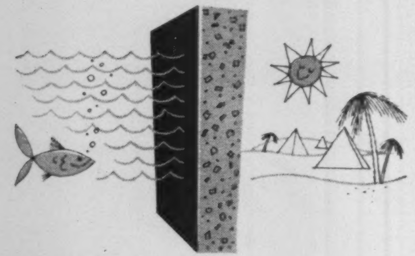

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air-conditioning, restaurants, Clark and Randolph Streets. **$3,000,000.**

Iowa, Walnut—Peace Haven Assn., Walnut, plans by Henningson, Durham & Richardson, Inc., 3555 Farnam St., Omaha, Neb., 85 unit HOUSING FOR ELDERLY. **$750,000.** Bids in Autumn. CD 1/19/61.

▲ **Md., Baltimore**—Royal Motel, Inc., c/o David Harrison, archt., 21219 St. Paul St., Baltimore 18, Md., 4 story air-conditioned MOTEL, 500-525 W. Franklin St. Over **$1,000,000.** Bids late Dec. or early Jan. 1962.

▲ **Mass., Cambridge**—Harvard University, Cambridge, plans by Minoru Yamasaki & Assocs., archts.-engrs., 1025 E. Maple St., Birmingham, Mich., 14 story BEHAVIORAL SCIENCE RESEARCH CENTER, Kirkland St. and Divinity Ave. **$5,500,000.** Constr. Spring 1962. CD 2/21/57.

▲ **Mich., Livonia**—Madonna College, 36800 Schoolcraft Rd., Livonia, CLASSROOMS, LABORATORY, CHAPEL, AUDITORIUM, RESIDENCE HALLS. **$5,000,000.**

▲ **Minn., West St. Paul**—Archdiocese of St. Paul, Chancery Office, 244 Dayton Ave., St. Paul, plans by B. J. Knowles Co. Inc., 540 Commerce Bldg., St. Paul, 1 story Catholic HIGH SCHOOL, Oakdale Ave. and Thompson Lake, **$3,000,000.** Bids September 1964.

N. H. **Derry**—Alexander Eastman Hospital, Old Chester Rd., East Derry, plans by Alexander J. Majeski, 23 Palomino Lane, Manchester, HOSPITAL, Birch St. and Pierce Ave. **$750,000.** Bids early 1962.

▲ **N. J., Bayonne**—Abraham H. Simon, 13-20 River Rd., Fairlawn, plans by Gerber & Pancani, 11 Commerce St., Newark, 10 story APARTMENT, Hudson Blvd. **$1,250,000.** CD 4/28/61.

▲ **N. J., Closter**—Alvin Benjamin & Assocs., 355 West Lena Ave., Freeport, N. Y., plans by George M. Vuinovilck, 624 Palisade Ave., Englewood Cliffs, SHOPPING PLAZA, professional offices and theatre, between Homans Ave. and Ver Valen St. **$2,300,000.** CD 8/18/61 under Owner, c/o George M. Vuinovick, archt. as owner.

▲ **N. J., Livingston**—Beau Constr. Co., c/o David Dowd, 54 East Mount Pleasant Ave., plans by Joseph D. Scrocco, 12 Rock Spring Rd., West Orange, 124-unit GARDEN APARTMENT, Beaufort Avt. **$1,400,000.** CD 6/23/61.

▲ **N. J., Newark**—David Moss, 103 10 East 43rd St., New York, N. Y., plans by Gerber & Pancani, 11 Commerce St., Newark, 8 story APARTMENT, Elizabeth and Hansbury Avenues. **$1,500,000.**

▲ **N. J., Park Ridge**—Dr. Otto Kretz, 183 Kinderkamack Rd., Park Ridge, plans by George Vuinovich, 624 Palisade Ave., Englewood Cliffs, Ridgemont Plaza SHOPPING CENTER, apartments, offices and stores. Over **$1,000,000.**

▲ **N. J., Princeton**—Religious of the Sacred Heart, 901 Rockville Pike, Washington, Zone 14, D. C., plans by Fulmer & Bowers, 341 Nassau St., Princton, SCHOOL and CONVENT, Great Road. **$2,500,000-$3,000,000.** CD 5/5/61.

▲ **N. J., Scotch Plains**—Diocese of Newark, 33 Mulberry St., Newark, plans by Anthony J. De Pace, 151 West 46th St., New York, Zone 36, N. Y., 2 story, steel, masonry SCHOOL, gymnasium, auditorium, South Martine Ave., 20 acres. **$3,000,000.**

▲ **N. J., South Plainfield**—Golden Acres, Inc., c/o Paul Miller, 1465 Forest Ave., Staten Island, N. Y., SHOPPING CENTER, Park Ave. **$3,000,000-$3,500,000.**

▲ **N. Y., Buffalo**—Buffalo General Hospital, 100 High, plans by James, Meadows & Howard, 250 Delaware Ave., 7 story HOSPITAL ADDN. and MEDICAL RESEARCH LABORATORY. **$1,500,000.**

▲ **N. Y., New York**—Burnside Realty Co., c/o Joseph S. Rosenblum, 20 E. 46 St., Zone 17, plans by S. J. Kessler & Sons, 598 Madison Ave., Zone 22, 16 story, 165 unit, 100 x 227 ft. APARTMENT, northwest corner East Burnside Ave. and Walton Ave., Bronx Boro. **$3,500,000.**

▲ **N. Y., New York**—Executive Equities, Inc., 770 Lexington Ave., Zone 21, plans by Oscar Silverstone, 665 Fifth Ave., Zone 19, APARTMENT, 500-510 E. 83 St. **$2,700,000.**

▲ **N. Y., New York**—Glickman Corp., 501 5 Ave., New York 17, plans by Schuman & Lichtenstein, 360 Lexington Ave., New York 17, N. Y., 16 story APARTMENT, 1056-64 Lexington Ave. northwest corner E. 75 St. **$2,500,000.**

▲ **N. Y., New York**—Jewelry Realty Corp., 678 Lexington Ave., Zone 22, plans by H. I. Feldman, 145 Lexington Ave., Zone 17, APARTMENT, 49-55 W. 47 St. **$1,037,000.**

▲ **N. Y., New York**—New York State Realty & Terminal Corp., 466 Lexington Ave., Zone 17, plans by Alfred Easton Poor, 400 Park Ave., Zone 22, STORES, BANK and OFFICES ALTERATIONS, 240-250 Park Ave. **$1,100,000.**

▲ **N. Y., New York**—145 East 27th St. Corp., 20 E. 46 St., Zone 17, plans by A. Rollin Caughey, 1200 Lexington Ave., Zone 28, APARTMENT, 145-165 E. 27 St. **$1,750,000.**

▲ **N. Y., New York**—Godfrey M. Weinstein & Co., Inc., 295 Madison Ave., Zone 17, 16 story Mark Terrace APARTMENTS, north side Tillotson Ave. between Boller and DeReimer Aves., Bronx Boro. **$3,873,240.**

N. Y., White Plains—John H. Baldwin, 10 Depot Plaza, plans by Burnett V. Vickers, 110 Mamaroneck Ave., 4 story, steel frame, aluminum curtain wall, The Baldwin OFFICE, north Broadway and Hamilton Ave. **$750,000.** Seeley Stevenson Value & Knecht, 101 Park Ave., New York, Zone 7, struct. engrs. CD 4/27/61.

▲ **N. C., Charlotte**—H. D. Albright, 511 W. Palmer St., 150,000 sq. ft. SHOPPING CENTER, York Rd., **$1,500,000.**

(Continued on page 242)

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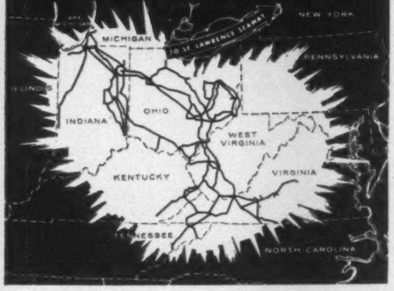

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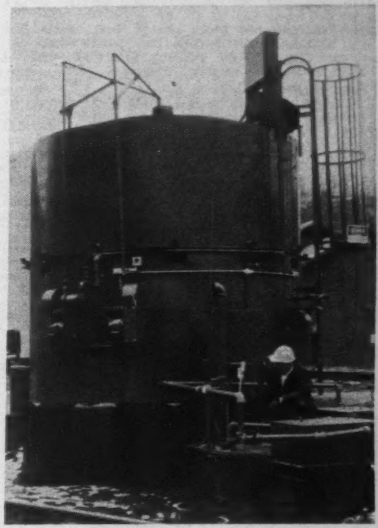

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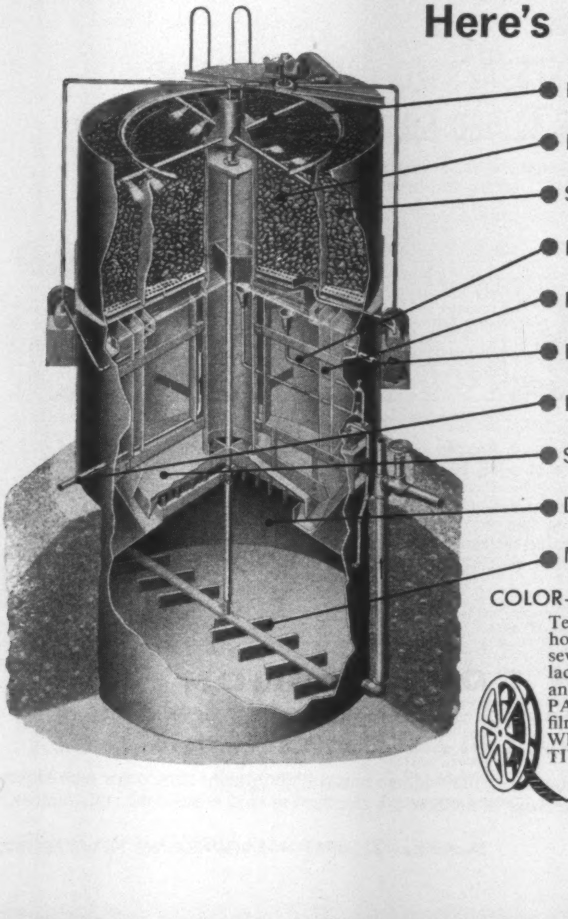
Here's How Bio-Pac Works



Bio-Pac two-stage treatment starts with removal of the settleable solids in a primary settling compartment. Then, sewage is pumped to two bio-filters operating in series, where aerobic bacteria remove 85 to 95% of the suspended solids and B.O.D. (Biochemical Oxygen Demand). The last stage, a final settling compartment, completes the process of producing a stable effluent.

Sludge from both primary and final settling compartments goes into the digester. Disposal of digested sludge can be done on drying beds or by tank truck haul-away about once or twice a year.

COLOR-SOUND FILM AVAILABLE

Ten minute, 16 mm. film, shows how BIO-PAC can give big city sewerage processing to areas that lack municipal facilities. Through animation, the operation of BIO-PAC is clearly illustrated. For film and BIO-PAC Folder 2971, WRITE LINK-BELT EXECUTIVE OFFICES TODAY.

LINK-BELT

SANITARY ENGINEERING EQUIPMENT

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. Sanitary Engineering Regional Office—Atlanta, Chicago 9, Colmar, Pa., Kansas City 8, Mo., San Francisco 24. District Sales Offices in All Principal Cities. Export Office, New York 7. Representatives Throughout the World. 15,600

(Continued from page 240)

▲ **N. C., Raleigh**—General Development Corp., c/o Graham Connell, Odd Fellows Bldg., plans by G. Milton Small & Assocs., 611 Tucker, Oak Park SHOPPING CENTER, **$1,000,000.** CD 7/25/60.

▲ **N. C., Raleigh**—North Carolina Methodist Conference, Methodist Bldg., plans by Davis & Ingram, 701 W. Johnson, CHILDREN'S HOME ENLARGEMENT. **$2,000,000.** CD 7/13/60.

▲ **O., Columbus**—First Community Church, 1320 Cambridge Ave., plans by Tibbals, Crumley & Musson, 965 E. Broad St., HOUSING FOR AGED, Upper Arlington, **$5,600,000.**

Pa., Easton—Lafayette College, College Hall, plans by S. Harman Brown, Jr., 18 E. Market St., Bethlehem, four DORMITORIES, **$750,000.** Joseph E. Biro & Associates, 832 W. Lafayette St., Easton, consult. engrs.

Tenn., Britol—Sunny Brook Motor Inns, Inc., Bluff City Highway, plans by Joe Cox, 316½ Main St., Johnson City, MOTOR HOTEL, **$750,000.** Loest & Stanley, Colonial heights, Kingsport, mech. engrs.

▲ **Tenn., Nashville**—John U. Wilson, c/o E. P. Wilson & Son, 1st American National Bank Bldg., SHOPPING CENTER, Nolensville Road, **$1,000,000.** Bids Mid-1962.

▲ **Wash., Seattle**—Northgate Co., 310 East 110th St., plans by John Graham & Co., 1426 Fifth Ave., Bon Marche branch DEPARTMENT STORE ADDN. **$6,000,000.**

▲ **Wis., Eau Claire**—Sacred Heart Hospital, 550 North Dewey St., HOSPITAL. **$7,200,000.**

▲ **Wis., Elm Grove**—Wisconsin Evangelist Lutheran Synod, 3624 West North Ave., Milwaukee, plans by Schutte, Phillips, Mochon, Inc., 11121 West Oklahoma Ave., Milwaukee, TEACHERS COLLEGE. **$1,528,000.**

▲ **B. C., Vancouver**—Bank of Canada, Wellington St., Ottawa, Ont., plans by Thomson, Berwick, Pratt, 1553 Robson, BANK, **$2,000,000.** D. W. Thomson Co., 1690 W. Broadway, consult. engrs. Simpson & McGregor, 1690 W. Broadway, elec. engr. Wiggs, Walford, Frost & Lindsay, 3285 Cavendish, Montreal, Que., consult. engrs.

▲ **B. C., Vancouver**—Royal Bank of Canada, 675 W. Hastings St., plans by Underwood, McKinley, Cameron, 1264 W. Pender St., BANK and OFFICES, Robson and Granville Sts., **$1,000,000.**

N. S., Sydney—St. Rita Hospital, Sydney, plans by C. D. Davison & Co., 95 Dresden Row, Armdale, NURSES' RESIDENCE, **$750,000.** Bids September, 1961.

▲ **Ont., Fort William**—Ramada Inn Motor Motel Co., c/o I. B. Margolese & Co., Ltd., 211 Paris Bldg., Winnipeg, Man., 7 story, HOTEL, two swimming pools, Brodie St. **$1,750,000.** Bids October or November 1961.

▲ **Ont., London**—E. K. McLean Constr. Co., 301 St. George St., plans by Donald McGugan, 1435 Commissioners Rd., 8 story, 100 unit, rein.-conc. APARTMENT, **$1,000,000.** CD 2/2/55.

INDUSTRIAL BUILDINGS

▲ **Fla., Tampa**—Tampa Electric Co., Cass & Tampa Sts., 200,000 kw Francis J. Gannon POWER PLANT ADDN. **$25,000,000.** Stone & Webster Engineering Co., 49 Federal St., Boston, Mass., consult. engr. Bids after Jan. 1962.

Ga., Augusta—Monsanto Chemical Co., 800 N. Lindbergh Blvd., St. Louis, Mo., CHEMICAL PLANT. Over **$800,000.**

▲ **Ga., Forest Park**, United States Rubber Co., 999 Lee St. SW, Atlanta, plans by James C. Wise, Simpson, Aiken & Assocs., 873 Spring St. NW, Atlanta, 215,000 sq. ft. WAREHOUSE-OFFICE, **$1,000,000.**

▲ **Ind., East Chicago**—Cities Service Oil Co., 60 Wall St., New York 5, N. Y., PLANT to manufacture napthalene, near existing refinery, 50,000,000 lb./yr. capacity. **$2,000,000.** CD 3/15/57.

▲ **Ind., Fort Wayne**—Peter Eckrich & Sons, Inc., Osage St., plans by Mox Pohlmeyer & Assocs., Central Bldg., MEAT PROCESSING PLANT, 37 acres, Engle Rd., Hayden Rd. and Wabash RR, **$1,000,000.** BA Spring 1962.

▲ **N. J., South Plainfield**—Golden Acres Inc., c/o Paul Miller, 1465 Forest Ave., Staten Island, N. Y., INDUSTRIAL PARK, Park Ave. and Oak Tree Rd. **$2,000,000.**

▲ **N. Y., New York**—Chrysler Corp. Services, Parts & Accessories Div., 7000 E. 11 Mile Rd., Center Line, Mich., 3 story, 85,000 sq. ft. SERVICE and PARTS GARAGE, Eleventh Ave., West 50 to West 51 St. Approx. **$1,000,000.**

AMERICANS ABROAD

▲ **Sweden, Maersta**—DuPont de Nemours Nordiska A/B, subsidiary E. I. duPont de Nemours & Co., duPont & Nemours Bldg., Wilmington, Del., U.S.A., plans by A. B. Byggplannering, Stockholm, Sweden, 2 story PLANT and OFFICE, WAREHOUSES, SHIPPING BLDG., LABORATORY. CD 8/14/61.

LATIN AMERICA

▲ **ARGENTINA**—Direcc. Nacional Vialidad, Av. Maipu 3, Buenos Aires, ROADS,

25 klms. paving R.288 Bahia Blanca-Punta A Ltd. Prov. Buenos Aires, **$2,500,000.**

168 klm. paving R.3 H. Ascasubi-Carmen de Patagones, Prov. Buenos Aires, **$7,500,000.**

40 klms. repaving and wid'n. R.7 Lujan-San Antonio de Giles, Prov. Buenos Aires, **$1,500,000.**

repaving and wid'n. 32.6 klms. R.7 San Antonio de Carmen de Areco, Prov. Buenos Aires, **$1,250,000.**

33 klms. repaving and wid'n. R.7 Chacabuco-O'Higgins, Prov. Buenos Aires, **$1,250,000.**

26 klm. repaving and wid'n. O'Higgins-Junin R.7, Prov Buenos Aires, **$1,000,000.**

120 klms. bit. coating R.9 Campana-Arroyo del Medio, Prov. Buenos Aires, **$2,250,000.**

58 klms. basic works and paving R.33 Tornquist-Pigue, Prov. Buenos Aires, **$2,187,000.**

41.4 klms. basic works and paving R.178 Pergamino-Arroyo del Medio, Prov. Buenos Aires, **$2,000,000.**

71.8 klms. repaving R.188 Pergamino-San Nicolas, Prov. Buenos Aires, **$2,500,000.**

60.4 klms. repaving (2nd Stage) R.8 Pergamino-Limit w/Santa Fe Prov., Prov. Buenos Aires, **$2,250,000.**

70 klms. basic works and paving R.227 Loberia-Napaleofu, Prov. Buenos Aires, **$3,125,000.**

51 klms. repaving and wid'n. R.227 Necochea-Loberia, Prov. Buenos Aires, **$1,250,000.**

50 klms. basic works and paving R.249 Perimetal Road BA Hia Blanca City, Prov. Buenos Aires, **$6,250,000.**

basic works and paving 140 klms. R.205 Saladillo-Bolivar, Prov. Buenos Aires, **$6,250,000.**

68 klms. basic work and paving R.38 El Protezuelo-Limit w/Tucuman Prov., Prov. Catamarca, **$3,400,000.**

248 klms. partial imprvs. R.89 Charata-Junction R.11, Prov Chaco, **$1,562,000.**

29 klms. paving R.11 Rio de Oro-Rio B Ermejo, Chaco Prov., **$1,462,000.**

75 klms. basic work and paving R.60 Quilino-Limit w/Catamarca, Prov. Cordoba **$1,875,000.**

65 klms. basic work and paving R.36 Espiniloo-Berrotaran, Prov. Cordoba, **$2.500,000.**

15 klms. basic work, paving and bridge R.36 Rio Cuarto-Espinillo, Prov. Cordoba, **$1,250,000.**

97 klms. repaving R.19 La Francia-Rio 10, Prov Cordoba, **$1,875,000.**

40 klms. basic work and paving R.9 Cordoba-Jesus Maria, Prov. Cordoba, **$2,000,000.**

66 klms. basic work and paving R.7 Mackena-Limit w/San Luis Prov., Prov. Cordoba, **$2,500,000.**

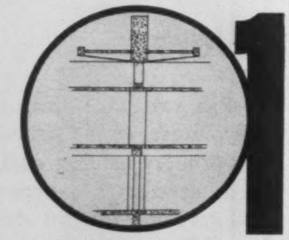
152 klms. basic work and paving R.7 Mackena-Limit w/Santa Fe Prov., Prov. Cordoba, **$5,750,000.**

▲ **Argentina, Buenos Aires** — Delta Industrial SA (Parsons and Whittemore Inc., **250 Park Ave., New** York, N. Y., U.S.A.), Av Roque S. Pena 636, Buenos Aires, CELLULOSE PLANT. **$12,000,000-$15,000,000.**

FOREIGN

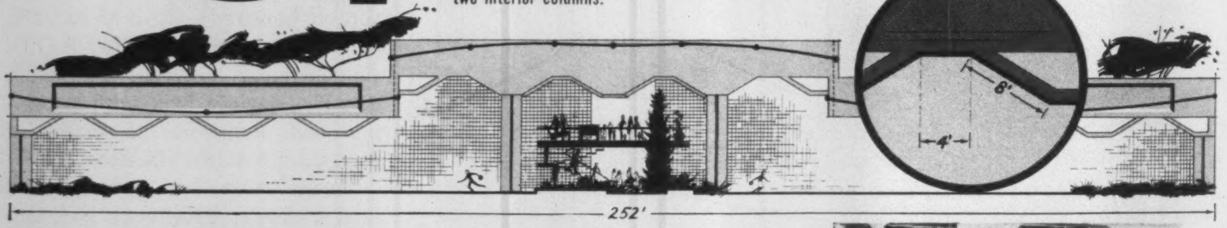
▲ **Australia, Sydney**—Quantas Airways, Quantas House, Sydney, HOTEL, Elizabeth and Bligh Sts. **$11,200,000.**

For additional reports see CONSTRUCTION DAILY NEWSLETTER



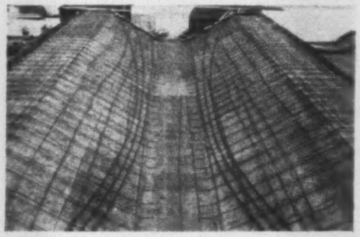
1 POST-TENSIONED PRESTRESSED CONCRETE BEAM HOLDS ROOF OF 42,500 SQ. FT. BOWLING ALLEY!

3½" thick folded plate lightweight prestressed concrete roof covers entire 252 ft. x 140 ft. building that has only two interior columns.



Three cast-in-place post-tensioned, prestressed concrete beams tied together with Prescon stressing tendons into one long unit make possible the unique structure of a 48 lane bowling alley that has no support columns in the lane area.

The Buccaneer Bowl in Corpus Christi, Texas was constructed at a cost of only $8.40 per square foot using a concrete roof and support beam prestressed by the Prescon System of post-tensioning. This price includes a partial basement, a mezzanine restaurant, observation deck and a luxurious lobby — all air conditioned. The cost of the folded plate and the supporting beams was $1.36 per square foot of area.



Forms built of 4' x 8' plywood sheets ready for pouring of folded plate roof. Stressing tendons provide strength for 70' span.

PRESCON

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CIRCLE 242 ON READER SERVICE CARD

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 27 Maine

STREETS AND ROADS

September 25 Connecticut September 26, 28, 29 Vermont

† **New Hampshire**—BA On Or About 10/10—U. S. Eng., 424 Trapelo Rd., Waltham 54, Mass., SPILLWAY CONSTR., excavation approx. 50,000 cu. yd. rock, removal existing bridge, removal existing power and telephone lines, temporary earth fill will be placed in bottom of discharge channel, temporary foot bridge, Surry Mountain Dam, approx. 4½ mi. north of Keene, Rte. 12A, ENG-19-016-62-16, $300,000.

▲† **Rhode Island**—BA On Or About 10/17—U. S. Eng., 424 Trapelo Rd., Waltham 54, Mass., furnishing, placing HEAVY QUARRY STONE for repair and rehabilitation of three existing BREAKWATERS, Point Judith, ENG-19-016-62-18, $1,500,000.

BUILDINGS—BA

▲ **Mass., Franklin**—BA 9/28—Dean Academy & Junior College, mens' DORMITORIES B & C; and women's DORMITORY, Mass CH-64-D-Dean Academy. $1,200,000. Plans deposit $100. Bastille, Halsey Assoc., 120 Tremont St., Boston, archts. Leo J. Crowley, 120 Tremont St., Boston,, mech. engr.

HEAVY CONSTRUCTION—LB & CA

▲ **MASSACHUSETTS**—Commonwealth Mass., Dpt. P. Wks., 100 Nashua St., Boston, ROAD,

Suburban Excavators, Inc., 4 New Salem St., Wakefield, Mass., CA **$2,282,475**, relocate section Rte. 2, Proj. F-348(12), Gardner-Westminster. BA 7/25. CD 7/28/61, under LB.

Giordano Constr. Co., 287 Main St., Branford, Conn., LB **$669,776**, (7 bidders), Contract 3, SEWERAGE SYSTEM, Easterly Section; LB **$526,267**, (7 bidders) Contract 4, SEWERAGE SYSTEM, Westerly section; LB **$211,919**, (9 bidders) Contract 5, SEWAGE PUMPING STATIONS; LB **$871,000**, (7 bidders) Contract 6, SEWAGE TREATMENT PLANT and OUTFALL SEWER, BRANFORD, CONN. Town, Town Hall, Branford, Conn. BA 9/7/61. CD 8/7/61.

BUILDINGS—LB & CA

▲ **Consolidated Constructors, Inc.**, 807 Congress St., Portland, Me., CA **$1,400,000**, POTATO PROCESSING PLANT, FORT FAIRFIELD, ME. Fort Fairfield Development Corp., 119 Main St., Fort Fairfield, Me. A & P Tea Co., National Products Div., 416 Main St., Presque Isle, Me., lessee. CD 3/29/61.

▲ **Thomas O'Connor & Co., Inc.**, 238 Main St., Cambridge, Mass., LB **$1,742,000**, est. approx. $1,800,000, (22 bidders), men's and women's DORMITORIES, MEDFORD, MASS. Tufts University, Harrison Ave., Medford, Mass. BA 9/12. CD 8/25/61.

Cardarelli Constr. Co., Inc., 143 Chaffee Ave., Waltham, Mass., LB **$637,970**, est. $660,000, (12 bidders), Meadow Brook Rd. JUNIOR HIGH SCHOOL ADDN., NEWTON, MASS. City, Purchasing Agent, City Hall, Newton Center, Mass. Cleveredon, Varney & Pike, 120 Tremont St., Boston, Mass., struc. engrs. BA 9/6. CD 8/9/61.

D'Addario Constr. Co., 513 Boston Ave., Bridgeport, Conn., CA **$360,000**, SITE IMPROVEMENT, ROCK REMOVAL, SEWER CONSTR., North End High School Site, BRIDGEPORT, CONN. Town, Bd. Educ., 171 Harrison St., BRIDGEPORT, Conn. CA 9/8/61. CD 9/1/61, under LB.

▲ **Town of Stamford, Purch. Agt.**, City Hall, Stamford, Conn., rejected bids Aug. 24, Riverbank ELEMENTARY SCHOOL, Riverbank Road, STAMFORD, CONN., LB **$1,069,525**. CD 9/5/61, under LB.

Craftsman Homes, Inc., 140 Rte. 5, South Windsor, Conn., Owner Builds, **$959,400**, 60 HOUSES, Birchwood Gardens, Bull Hill Lane, WEST HAVEN,CONN.

MIDDLE ATLANTIC

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 5 New Jersey October 13 Pennsylvania

STREETS AND ROADS

October 3 Delaware October 5, 11 New Jersey

October 13 Pennsylvania

New York—BA 9/25—Power Auth. State of New York 18 Floor, The Coliseum Tower, 10 Columbus Circle, New York 19, N.Y., 2 story 12 x 120 ft. OBSERVATION (Overlook) BLDG. located above El. 576 ft. 1 in. south Butteress of Robert Moses Niagara Power Plant, 1 story, bsmt. fdn. 89 sq. ft. RECEPTION BLDG. and stair tower connecting enclosed overpass approx. 13 ft. wide x 8 ft. high by 238 ft. long connecting these two bldgs.; section of Lewiston Rd. and South Approach Rd. and relocated work in and around South Buttress and Service Tunnel, Lewiston, Niagara Co. Spec. No. PA-N-23043 Niagara Contr. No. N34. Plans $20 per initial set and $15 per set for addnl. sets no part of which will be refunded. CD 8/15/57.

N. Y., Levittown—BA 10/12—Bd. Town of Levittown, North Village Green, Levittown, 2 story LIBRARY, Bluegrass and Shelter Lanes. $465,000. F. E. Allardt, Jr., 50 Main St., Southampton, N. Y., archt. Benjamin & Flack, 37 W. 39 St., New York 18, N. Y., mech. engrs. Throop & Feiden, 207 E. 37 St., New York 16, N. Y., struct. engrs. CD 6/6/61.

▲ **N. Y., New York**—BA 10/16—New York City Transit Auth., 370 Jay St., Brooklyn, Zone 1, furnishing, installing modern BLOCK SIGNAL and INTERLOCKING SYS. for Broadway-7th Ave. Line, IRT Div., Section 1, 96 St. to 157 Sts., Section 2, 157 St. to 242 St. incl. 240 Street Yard, Contr. S-104, Manhattan and Bronx Boros. Extended date. CD 8/14/61.

BUILDINGS—BA

▲ **N. Y., Brooklyn**—BA 9/26—New York City Housing Auth., Rm. 312, 299 Broadway, New York, Zone 7, (1) fdns. and general constr, (2) heating and ventilating, (3) electric work, (4) plumbing work at Jonathan Williams HOUSES, Proj. NYS-101, Marcy Ave., Division Ave., Roebling St. and Broadway excluding certain portions of area along Broadway, Brooklyn Boro, $10,855,000. Plans deposit $75; furnishing and installing ELEVATORS Jonathan Williams Houses. Plans deposit $25. Extended date. CD 9/6/61.

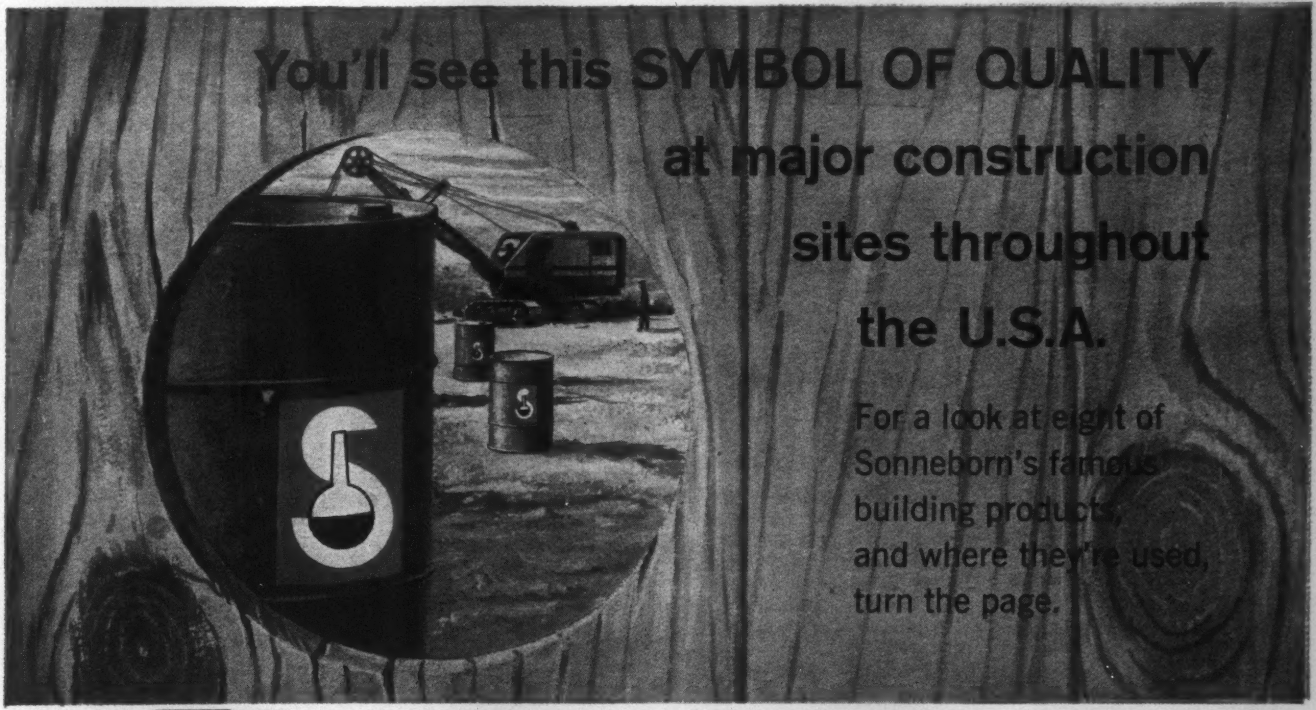
N. Y., New York—BA 9/22—Dpt. P. Wks., Rm. 1800-L, Municipal Bldg., New York, Zone 7, Contr. 1, general constr. South Manhattan Repair Co. HEADQUARTERS Henry, Pike and Madison Sts., Manhattan Boro. Plans deposit $40. Bids Aug. 9 rejected, LB **$487,140**. CD 8/14/61, under LB.

N. J., Bellmawr—BA 9/28—Bd. Educ., Victory Dr., ELEMENTARY SCHOOL. Creek Rd., $400,000. Albert & Thomas. 410 Marlton Ave., Pennsauken, archts. CD 5/15/61.

HEAVY CONSTRUCTION—LB & CA

D. H. Fellows Constr. Corp., Manlius Center Rd., Syracuse, N. Y., LB **$691,833**, FIELD HOUSES, State University Colleges of Education at Cortland, Cortland Co., CD 3/27/57; Brockport, Monroe Co., CD 3/20/57; Oswego, Oswego Co., CD 3/26/57, NEW YORK. State Dpt. P. Wks., State Office Bldg., Albany, N. Y. BA 9/6.

▲ **Hendrickson Bros., Inc.**, 63 N. Central Ave., Valley Stream, N. Y., LB **$1,395,128**, (2 bidders), Contr. 1088-D, 11,000 ft. DRAINS, Rockaway Rd., Woodfield Rd. and Elm St., Garden City and West Hemp-



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CIRCLE 243 ON READER SERVICE CARD

stead, Town of Hempstead, MINEOLA, N. Y. Dpt. P. Wks., Nassau Co., Old County Courthouse, Franklin Ave., Mineola, N. Y. BA 9/12. CD 9/5/61.

Radory Constr. Corp., 94 Cherry Valley Rd., West Hempstead, N. Y., LB **$275,635**, (5 bidders), Contr. 641-H, IMPRVT. 8,010 ft. Meacham Ave., CURBS, SIDEWALKS and drainage from Dutch Broadway northerly to Hempstead Farmingdale Turnpike, Elmont, Town of Hempstead, MINEOLA, N. Y. Dpt. P. Wks., Nassau Co., Old County Courthouse, Franklin Ave., Mineola, N. Y. BA 9/12. CD 9/5/61;
Zara Contg. Co., Inc., Engel St., Hicksville, N. Y., LB **$174,971**, (4 bidders), Contr. 500, IMPRVT. 6,100 ft. Oceanside Rd., CURBS, SIDEWALKS and drainage, Mott St. northerly to Davison Ave., Oceanside, Town of Hempstead (Mineola, N. Y.).

R. Zoppo Co., Inc., 842 Providence Hy., Norwood, Mass., CA **$883,900**, LOW-LIFT WATER PUMPING STATION, Rigney Bluff Station, Town of Greece, ROCHESTER, N. Y. Monroe County Water Auth., 339 East Ave., Rochester, N. Y. BA 8/30. CD 9/7/61, under LB.

MARYLAND—State Rds. Comn., 300 W. Preston St., Baltimore, Zone 3, Bids opened 9/5, BRIDGE,
J. G. Prentiss & Co., 5707 Belair Rd., Baltimore 6, Md., LB **$356,945**, est. $250,000-$500,000, (16 bidders), four 3-span steel beam bridges on Baltimore Beltway at Northeastern Expressway Interchange, B-682-13-420, Baltimore Co. CD 8/14/61.

▲ **J. Richard Nissley**, Landisville, Pa., LB **$4,666,946**, (11 bidders), Jones Falls Expressway INTERCHANGE, Belvedere Ave. (Northern Blvd.), BALTIMORE, MD. City Bureau Hys., 303 Municipal Bldg., Baltimore 2, Md. BA 9/13. CD 8/22/61.

Matricciani, Inc., 408 S. Caroline St., Baltimore 31, Md., LB **$304,597**, (5 bidders), Proj. 772-W, WATER MAIN EXTENS. along Cromwell Bridge Rd., TOWSON, MD. Baltimore County, County Office Bldg., Towson 4, Md. BA 9/7. CD 8/23/61.

D. C. Govt. Dpt. Hys., 499 Pennsylvania Ave. N.W., Wash., D. C., rejected bids Aug. 28, ROADWAY and STRUCTURES, south approach to new West Highway Bridge over Potomac River, vicinity 14th St, WASH., D. C. LB **$893,343**. Will re-advertise. CD 8/21/61, under LB.

▲ **Blythe Bros. Co. & Howard Constr. Co.**, P.O. Box 989, Charlotte, N. C. CA **$2,053,102**, POTOMAC INTERCEPTOR SEWER, UNIT No. 8, Sugarland Segment near Sterling, Va., WASH., D. C. D. C. Govt. Dpt. Sanitary Engineering, 499 Pennsylvania Ave. N.W., Wash., D. C. BA 8/30/61. CD 9/1/61, under LB.

BUILDINGS—LB & CA

Trustees of the Teachers Home, 27 Mildred Ave., Poughkeepsie, N. Y., rejected bids Aug. 4, RETIRED TEACHERS RESIDENCES, DE WITT (BR. SYRACUSE), N. Y. **$750,000**. Will re-advertise. CD 7/24/61.

▲ **Milau Assocs., Inc.**, 310 Northern Blvd., Great Neck, N. Y., CA **$2,000,000**, 7 story, 138 unit Crossway Airport INN, 110-30 Ditmars Blvd. at 23 Ave., FLUSHING, N. Y. Crossway Motor Hotels, Inc., 54 Tarrytown Rd., White Plains, N. Y. Brodsky Hopf & Adler, 220 E. 23 St., New York 10, N. Y., archts.-engrs. CD 9/11/61, under N. Y., Jackson Heights.

▲ **Sperry Constr. Corp.**, 163-18 Jamaica Ave., Jamaica, N. Y., CA Est. **$1,000,000**, 4 story, 30,000 sq. ft. G.N. International OFFICE, Great Neck Rd. and Knightsbridge Rd., GREAT NECK, N. Y. Owner, c/o contractor Walter E. Blum, 21 Brook Lane, Great Neck, N. Y., archt. Joseph Bressman, 118 E. 28 St., New York 16, N. Y., mech. engr. Thompson & Czark, 609 Garden Lane, East Meadow, N. Y., struct. engrs.

Amdor Structures, Inc., 156 E. 83 St., New York 28, N. Y., CA Est. **$500,000**, 2 story, 12,600 sq. ft. MEDICAL CENTER, Third Ave. between 68 St. and Senator St., NEW YORK, N. Y. Bay Ridge Medical Group, 7710 Fourth Ave., Brooklyn 9, N. Y. Henry L. Horowitz, 443 Park Ave. So., New York 16, N. Y., archt.

Nicholas Coblio & Sons, 262 Exchange St., Geneva, N. Y., LB **$405,871**, HOSPITAL, SENECA FALLS, N. Y. Town of Seneca Falls, Town Hall, 136 Falls St., Seneca Falls, N. Y. BA 8/2. CD 7/24/61.

Joseph Carillo, Crook Hill Rd., Huntington, N. Y., Owner Builds, **$500,000**, 2 story, bsmnt., 50 unit Maple Gardens APARTMENTS, south of Main St., SMITHTOWN, N. Y. Frederick T. Bock, 570 Broadway, Amityville, N. Y., archt.

Potenti Constr. Co., 162 Second St., Bergenfield, N. J., Owner Builds, **$650,000**, 60-unit GARDEN APARTMENT, West Church St., BERGENFIELD, N. J. Harsen & Johns, 60 Westervelt Ave., Tenafly, N. J., archts.

▲ **Parkway House, Inc.**, 1100 McCarter Hy., Newark, N. J., Owner Builds, **$3,500,000**, 14 story, 170-unit APARTMENT, Garden State Parkway Drive and Fourth Ave., EAST ORANGE, N. J. CD 5/8/61.

▲ **Cali Associates**, 290 Hobart St., Perth Amboy, N. J., Owner Builds, **$1,500,000**, 60 HOUSES, off Prospect Ave., EDISON, N. J. S. J. Potter, 410 Colonial Ave., Union, N. J., archt.

▲ **Presidential Homes, Inc.**, Arneys Mountain Rd., Pemberton, N. J., Owner Builds, **$1,500,000**, 120-unit RESIDENTIAL DEVELOPMENT, Church Rd., ERLTON, N. J.

Robert Constr. Co., 122 McIntosh Rd., Delaware Twp., Merchantville, N. J., Owner Builds, **$500,000**, 40-unit RESIDENTIAL DEVELOPMENT, Pippin Court, ERLTON, N. J. Lester H. Weckesser, 16 Montana Ave., Erlton, N. J., archt.

Chrysler Constr. Co., 325 Beechwood Rd., Ridgewood, N. J., Owner Builds, **$500,000**, 15 HOUSES, Ackerman Ave., HO-HO-KUS, N. J. Kordys & Oldziey, 1379 Hamburg Turnpike, Wayne, N. J., archts.

▲ **White Constr. Co.**, 305 East 45th St., New York, N. Y., CA Est. **$1,000,000**, ARTS CENTER, LAWRENCEVILLE, N. J. Lawrenceville School, Administration Bldg., Lawrenceville, N. J. BA 8/24/61. CD 9/7/61, under LB.

Albert Wassberg, Inc., 41 West Quackenbush Ave., Dumont, N. J., Owner Builds, **$750,000**, 25 HOUSES, off Irving St., MIDLAND PARK, N. J. CD 5/31/61.

Wm. Connolly & Sons, 14 Handy St., New Brunswick, N. J., CA Est. **$400,000**, YOUTH CENTER, Powers St., NEW BRUNSWICK, N. J. Diocese of Trenton, Chancery Office, State St., Trenton, N. J., and Parish St. Mary of Mt. Virgin, 190 Sanford St., New Brunswick, N. J. Edward McCarthy, 610 Arlington Ave., Plainfield, N. J., archt.

▲ **Houdry Process Corp.**, 1528 Walnut St., Phila., Pa. Owner Builds, Over **$1,000,000**. CHEMICAL PLANT, PAULSBORO, N. J.

Barchay White & Co., 3337 Market St., Phila., Pa., CA **$600,000**, 120 units MOTOR INN, incl. swimming pool, restaurant, PENNSAUKEN, N. J. Walt Whitman Motor Inn Corp., c/o William W. Bond Jr. & Assoc., Inc., archt., 3728 Lamar Ave., Memphis, Tenn.

Tryon Constr. Co., Fairview Terrace, Paramus, N. J., CA Est. **$800,000**, 50 HOUSES, streets off Terrill Rd., PLAINFIELD, N. J. Tedco Alvin Co., 1931 Duncan Drive, Scotch Plains, N. J., Walter Pfeiffer, 105 Washington St., Morristown, N. J., archt. Sailer & Sailer, 64 Broad St., Elizabeth, N. J., engrs.

Brief Constr. Corp., 175 Midland Ave., Newark, N. J., Owner Builds, **$400,000**, RESIDENTIAL DEVELOPMENT, Barbara Lee Drive, etc., TRENTON, N. J.

W & R Constr. Co., 5 Millbrook Lane, Trenton, N. J. Owner Builds, **$700,000**, 72 unit APARTMENT DEVELOPMENT, TRENTON, N. J. Philip Sheridan Collins, 12 Boudinot St., Princeton, N. J., archt.

▲ **United Engineers & Constructors, Inc.**, 1401 Arch St., Phila., Pa., CA Est. **$6,250,000**, design and construct 100 ton ELECTRIC FURNACE, scrap handling area, mold stripper bldg., and mold storage and preparation bldg., COATSVILLE, PA. Lukens Steel Co., 1958 Lukens Bldg., Coatsville, Pa.

Massa Bros., Inc., 1503 8th Ave., Beaver Falls, Pa., LB **$409,957**, est. $400,000 (12 bidders), ELEMENTARY SCHOOL, Northeastern Beaver County

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All Sonneborn products are of the highest quality. They're formulated by specialists and backed by Sonneborn's more than half a century of experience. All products are continually tested for uniformly high quality: every batch must meet exacting specifications. Sonneborn also offers customers expert services from its experienced staff of building materials specialists. These specialists help you solve almost any building protection problem—selecting exactly the right floor treatment, choosing the most efficient sealant for curtain wall construction, etc.

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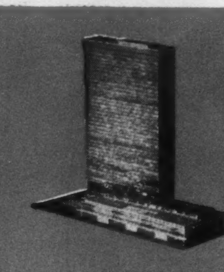

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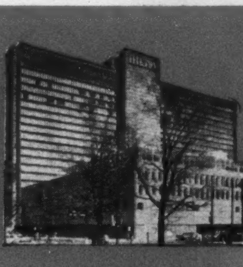

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School Bd., P.O. in Lawrence Co., Proj. No. C13-715, ELLWOOD CITY, PA. Pa. Pub. Sch. Bldg. Auth., 101 S. 25th St., Harrisburg, Pa. BA 9/12/61. CD 8/11/61.

▲ **Irving B. Levinson,** Morrisville, Pa., Owner Builds, Over **$1,000,000,** 120 units, APARTMENT DEVELOPMENT, FAIRLESS HILLS, PA. Laibow & Vogel, 2307 Haines Rd., Levittown, Pa., archts.

▲ **Cross Realty Co.,** Hatboro, Pa., Owner Builds, **$1,350,000,** 12 APARTMENTS, SEWERS, WATER LINES, LANSDALE, PA. Leon L. Levin, 1923 Manning St., Phila., Pa., archt.

▲ **Mason McDowell Corp.,** 8902 West Chester Pike, Kirklyn, Pa., Owner Builds, **$2,100,000;** 200 RESIDENTIAL DEVELOPMENT (200), Mayers Rd., LANSDALE, PA.

▲ **Leonard Polis,** Hatboro, Pa., Owner Builds, **$1,350,000,** 12 APARTMENTS, S. Broad St., LANSDALE, PA. Leon L. Levin, 1923 Manning St., Phila., Pa., archt.

Style-Craft Builders, 6730 Old York Rd., Phila., Pa., Owner Builds, **$600,000,** RESIDENTIAL DEVELOPMENT (40) Park Towne Estates, MORRISVILLE, PA.

Cross Realty Co., Hatboro, Pa., Owner Builds, **$350,000,** PARKING GARAGE, Penn St., NORRISTOWN, PA. Leon L. Levin, 1923 Manning St., Phila., Pa., archt.

Mano Constr. Co., Inc., 1720 Harding Blvd., Norristown, Pa., Owner Builds, **$400,000,** RESIDENTIAL DEVELOPMENT (21), Stanbridge St., NORRISTOWN, PA. (**Correction**—price.) CD 9/13/61, under CA.

Crestwood Builders, Inc., Jenkintown, Pa., Owner Builds, **$400,000,** RESIDENTIAL DEVELOPMENT (37), N. Hereford Lane, etc., PHILA., PA. C. Zel Bender, 225 N. 6th St., Camden, N. J., archt.

Gene Mark Constr. Co., 8309 Old York Rd., Elkins Park, Pa., Owner Builds, **$600,000,** RESIDENTIAL DEVELOPMENT (36), Endicott St., PHILA., PA.

Carl Metz, 766 York Rd., Jenkintown, Pa., Owner Builds, **$400,000,** RESIDENTIAL DEVELOPMENT (31), Vicaris St., PHILA., PA.

▲ **Stewart Loucheim,** 2925 N. Broad St., Phila., Pa., Owner Builds, Over **$1,250,000,** 144 units, 8 APARTMENTS, Welsh Rd., WILLOW GROVE, PA.

Victor R. Beauchamp, Inc., 431 Cedar St., N.W., Wash., D. C., LB Est. **$600,000,** MEN'S DORMITORY, WASH., D. C. Catholic University of America, 620 Michigan Ave., N.E., Wash., D. C. BA 8/29/61. CD 8/4/61.

Aldo Gibellino & Son, 5100 Washington St., Wilmington, Del., Owner Builds, **$400,000,** RESIDENTIAL DEVELOPMENT, Penn Acres, NEW CASTLE, DEL.

Gordy Enterprises, Inc., Washington Ave. and DuPont Blvd., New Castle, Del., Owner Builds, **$400,000,** RESIDENTIAL DEVELOPMENT, Rambleton Acres, NEW CASTLE, DEL.

SOUTH

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 29 Alabama, Tennessee

STREETS AND ROADS

September 27 Louisiana September 28 Florida

September 29 Alabama, Kentucky, Tennessee

† **Va., Langley Field**—BA 10/9—National Aeronautics & Space Admin., Bldg. 1195, Langley Field, CRYOGENIC HELIUM GAS PURIFIER SYSTEM FACILITY, Proj. L-1872. $500,000. CD 8/16/60.

BUILDINGS—BA

Miss., **Ellisville**—BA 9/27—State Bldg. Comn., State Office Bldg., Jackson, REHABILITATION and CONVALESCENT CENTER at Ellisville State School. $850,000. Plans deposit $50. Bill Archer, 203 Ridder Bldg., Meridian, and R. B. Clopton, Roebuck Dr., Meridian, archts.

Ala., Brewton—BA 9/28—Brewton Housing Auth., P. O. Box 712, low rent HOUSING UNITS, $400,000. Plans deposit $50. Tomberlin & Sheetz, 1429 Peachtree St., NE, Atlanta, Ga., archts. CD 1/13/61.

Ala., Jacksonville—BA 9/28—Jacksonville State Teachers College, Jacksonville, 40,000 sq. ft. MEN'S DORMITORY. $450,000. Plans deposit $50. Paul W. Hofferbert, 220 S. 8th St., Gadsden, archt. CD 7/19/61.

N. C., Chapel Hill—BA 9/28—University of North Carolina, Chapel Hill, SHOP-STORE. $400,000. Plans deposit $75. Thomas T. Hayes & Assocs., 210 E. New Hampshire Ave., Southern Pines, archts. CD 11/25/59.

▲ **Ky., Louisville**—BA 10/5—University of Louisville, 3 and Shipp Sts., Zone 8, MEDICAL DENTAL APARTMENTS, Gray St. between Present and Jackson, adjacent to Louisville Medical Center. $1,200,000. Plans deposit $50. Arrasmith & Tyler, 501 Park Ave., Zone 8, archts. Carr-Roy & Assocs., 301 W. Liberty, Zone 2, engrs. CD 7/24/61.

N. C., **Rutherfordton**—BA 10/10—Rutherford Co. Bd. Educ., Courthouse, 40,000 sq. ft. Hope ELEMENTARY SCHOOL, $400,000. Plans deposit $40. Clemmer & Horton, 226 2nd St., NW, Hickory, archts. CD 8/21/61.

▲ **Ala., Mobile**—BA 10/17—Mobile County School Bd., Courthouse, Davidson HIGH SCHOOL at Azalea and Pleasant Valley Rds. $2,500,000. Platt Roberts & Co., 1010 Merchants National Bank Bldg., archts. CD 5/12/61.

BUILDINGS—SLC

▲ **Va., Lynchburg**—Malcolm Wilder, 1001 Church St., soon lets contract, Presidential Inn MOTEL, Maine and Pearl Streets. Harvey Gordon & Assoc., 904 20th St. N.W., Wash., D. C., archts. CD 8/7/61.

HEAVY CONSTRUCTION—LB & CA

Atkinson Dredging Co., 2615 Canal Rd., Norfolk 6, Va., LB **$458,000,** MAINTENANCE DREDGING, Sunny Point Army Terminal, ENG-31-075-62-2, SOUTHPORT, N. C. U. S. Eng., 309 Customhouse, Wilmington, N. C. BA 8/29/61. CD 8/11/61.

▲ **Clement Betpouey, Jr. & Co.,** 1426 NBC Bldg., New Orleans, La., LB **$660,194,** (4 bidders), Proposal No. 2, SANITARY SEWERAGE, Terrebonne Parish, HOUMA, LA. Terrebonne Parish Sewerage Dist. No. 14, Houma, La. DeFraites Assn., 320 E. Main St., Houma, La., engrs.;
Larry Doiron Constr. Co., Box 761, Morgan City, La., LB **$653,536,** (5 bidders), Proposal No. 1, SANITARY SEWERAGE (Houma, La.).

Talon Constr. Co., Box 2017, Texarkana, Tex., LB **$964,492,** (5 bidders), WATER DISTRIBUTION SYS., Caddo Parish, SHREVEPORT, LA. Caddo Parish Water Works Dist. No. 4, Shreveport, La. G. A. Heft & Co., 820 Union St., New Orleans, La., engrs.

▲ **KENTUCKY**—Commonwealth Ky., Dpt. Hys., Frankfort, ROADS,

Ky.—**Kenny Constr. Co.,** 3220 Oakton St., Skokie, Ill., CA **$4,848,953,** grade, drain on Interstate 4.16 mi. Louisville-Catlettsburg, I 64-8(6)189 F 537(8), Boyd Co.;

Ky.—**R. B. Potashnick,** Box 423 Cape Girardeau, Mo., CA **$1,758,366,** grade, drain 1.444 mi. Louisville-Catlettsburg, I-64-8(7)183, Boyd Co. BA 8/18. CA 8/21. CD 8/23/61, under LB.

Oman Constr. Co., Acklen Park, Nashville, Tenn., LB **$476,432,** Contr. 4, GRADING, PAVING, SIDEWALKS, STORM SEWERS, CHATTANOOGA, TENN. Chattanooga Housing Authority, 1914 McCallie Ave., Chattanooga, Tenn. BA 9/6/61. CD 8/21/61.

BUILDINGS—LB & CA

▲ **W. F. Thompson Constr. Co.,** 3228 Ponce DeLeon Blvd., Coral Gables, Fla., CA **$1,127,799,** Collier County COURT HOUSE and OFFICE BLDGS., East Naples, EVERGLADES, FLA., Bd. Comrs., Collier

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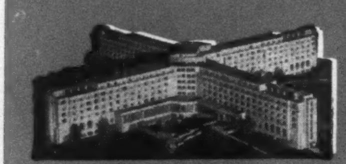
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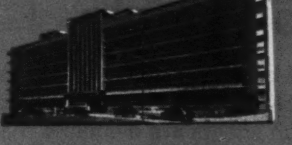
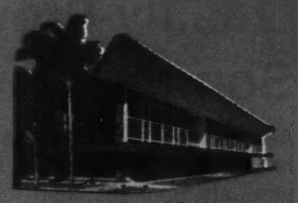

Providence Hospital
Mobile, Alabama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Tests prove HYDROCIDE S-X HYCON® with its special "high contact angles" silicones provides longer life water repellency, than ordinary silicones. HYDROCIDE S-X HYCON® also helps keep buildings cleaner . . . minimizes efflorescence . . . helps prevent spalling and cracking.

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CIRCLE 245 ON READER SERVICE CARD

Co., Courthouse, Everglades, Fla. BA 9/7/61. CA 9/12/61. CD 9/12/61, under LB.

Witters Constr. Co., P.O. Box 6, Riverside Station, Miami, Fla., LB Est. **$325,000**, FOOD WAREHOUSE-OFFICE, MIAMI, FLA. National Dairy Products Corp., Kraft Foods Division, Forest Lane, Garland, Tex. BA 8/22/61. CD 8/2/61.

Edw. J. Gerrits, Inc., 447 5th St., St. Petersburg, Fla., CA **$650,000**, est. $500,000, CHURCH, ST. PETERSBURG, FLA. St. Judes Catholic Church, 58th St. and 5th Ave. N., St. Petersburg, Fla. Bruce & Parrish, 939 Beach Dr. N., St. Petersburg, Fla., archts. CD 3/24/60.

▲ **T. T. Jones Constr. Co.**, 4080 Perry Hy., Box 906, Tallahassee, Fla., LB **$1,044,000**, (8 bidders), Proj. 0825, HEALTH and PHYSICAL BLDG., Florida A & M University, TALLAHASSEE, FLA. Florida State Bd. Control, Jones Hall, Boulevard St., Tallahassee, Fla. BA 9/7/61. CD 8/18/61.

Brice Building Co., 1021 2nd Ave. N., Birmingham, Ala., LB **$469,900**, CHURCH SANCTUARY, MOUNTAIN BROOK, ALA. St. Luke's Episcopal Church, 3736 Montrose Rd., Mountain Brook, Ala. Nelson Smith, Brown-Marx Bldg., Birmingham, Ala., archt.

▲ **Barksdale Brothers Corp.**, 6425 Greenwell Springs Rd., Baton Rouge, La., LB **$1,279,000**, combination bid, two DORMITORIES, HAMMOND, LA. Southeastern Louisiana College, Hammond, La. BA 9/12. CD 8/29/61.

Bartley, Inc., 433 Gravier St., New Orleans, La., LB **$527,217**, est. $560,000, (5 bidders), 3 story, rein.-con., brick and glass ADMINISTRATION-CLASSROOM ADDN., McNeese State College, LAKE CHARLES, LA. State Bond & Bldg. Comn., Rm. 101, Civil Service Bldg., Baton Rouge, La. BA 9/6. CD 8/25/61.

Southern Builders, Inc., Box 13371, New Orleans, La., LB **$914,000**, est. $800,000, (10 bidders), 2 story, 60,000 sq. ft. HIGH SCHOOL, 1 story CAFETERIA; 1 story FACULTY RESIDENCE; 1 story CHAPEL, SHREWSBURY, LA. Catholic Archdiocese of New Orleans, 724 Camp St., New Orleans, La. BA 9/1. CD 8/14/61.

▲ **Wilson P. Abraham Constr. Co.**, Box 2870 Baton Rouge, La., LB **$1,157,000**, est. $1,060,686, (10 bidders), 100 unit low-rent HOUSING, Proj. La. 11-1, WESTWEGO, LA. City Housing Auth., 405 Sala Ave., Westwego, La. BA 9/5. CD 8/10/61.

Ernest Simpson, Glasgow, Ky., LB **$448,500**, (7 bidders), T. J. Samson Barren County COMMUNITY HOSPITAL, GLASGOW, KY. City, City Hall, Glasgow, Ky. BA 8/3. CD 7/19/61, under Commercial Buildings.

Project Fabrication Corp., College Point 56, N. Y., LB **$519,526**, NITROGEN GENERATING FACILITY BLDG., 9727-3Y-12 plant, OAK RIDGE, TENN. Union Carbide Nuclear Co., P.O. Box E, Oak Ridge, Tenn. BA 8/17/61. CD 7/21/61.

MIDDLE WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS
BRIDGES
September 26 Indiana

BUILDINGS—BA

▲ **O., Dover**—BA 10/3—Dover Bd. Educ., HIGH SCHOOL, Over $1,000,000. Plans deposit $30. Outcalt-Guenther & Van Buren, 13124 Shaker Sq., Cleveland, Zone 20, archts. CD 2/28/61.

HEAVY CONSTRUCTION—LB & CA

▲ **OHIO**—State Hy. Dpt., State Depts. Bldg., Columbus, Zone 15, Bids opened 9/12, ROADS,

O.—**Foley Constr. Co.**, 5050 Orchard St., Cincinnati, O. LB **$5,727,855**, est. $6,734,000, (3 bidders), 1.36 mi. Millcreek Expressway, Cincinnati, between Flint St. and Marshall Ave., incl. seven bridges and reconstr. Western Hills Viaduct, Proj. 639, Hamilton Co.;

O.—**Pierce Constr. Co.**, 3005 Bellevue St., Toledo, O., LB **$1,320,426**, est. $1,634,900, (4 bidders), widening 4 mi. Alexis Rd. (USR 24-B) to 4-lanes with divider between Secor and Telegraph Rds., Proj. 642, Lucas Co.;

O.—**Arthur S. Langenderfer, Inc.**, 4690 W. Bancroft St., Toledo, O., LB **$631,094**, est. $803,300, (5 bidders), reconstr. and widen six mi. US R 6 eastward from Telena, incl. new bridges at Muddy and Muskellunge Creeks, Proj. 644, Sandusky Co.;

O.—**Harry Miller Excavating Co., Inc.**, Akron-Canton Rd. Akron, O., **National Engineering & Contracting Co., Inc.**, 1968 W. 3rd St., Cleveland, O. and **Central States Constr. Co.**, P. O. Box 148, Wadsworth, O., LB **$2,371,368**, est. $2,846,600, (7 bidders), 1.48 mi. US R 224 (IR 271) from Akron-Barberton corp. line east to new junction with Waterloo Rds., Proj. 645, Summit Co. CD 8/15/61.

▲ **M. F. Velotta & Sons**, 33141 Bainbridge Rd., Solon, O., and **Condon-Cunningham, Inc.**, 739 S. James Rd., Columbus, O., LB **$3,553,748**, est. $3,700,000 (3 bidders), PAVING Rockside Rd. from Brecksville to Turney Rds., CLEVELAND, O. Bd. Comrs. Cuyahoga Co., County Admin. Bldgs., 1219 Ontario St., Cleveland 14, O. Albert S. Porter, Standard Bldg., Cleveland 13, O., co. engr. BA 9/7/61. CD 8/14/61

Shullo Constr. Co., 1200 Home St., Akron, O., LB **$466,214**, (Combined bid) (6 bidders), North End and Sippo RELIEF TRUNK SEWERS; LB **$359,241**, est. $380,000, (7 bidders), SIPPO TRUNK SEWER, CD 6/6/61 LB, MASSILLON, O. City, City Hall, Massillon, O. Floyd G. Browne & Assocs., 125 W. Church St., Marion, O., engr.

Harry Miller Excavating Co., Akron-Canfield Rd., Akron, O., LB **$98,314**, (5 bidders), North End Trunk RELIEF SEWER, Contract 3A, (Massillon, O.).

MICHIGAN and ONTARIO—International Bridge Auth., Box 317, Saulte Ste. Marie, Mich., BRIDGE,

Foundation Co. of Canada Ltd., 166 Douglas St. W., Sudbury and Toronto, Ont., CA **$977,935**, International Toll Bridge STRUCTURE, concrete deck, grading, drainage, paving, etc., for Canadian spans, approach and plaza, Sault Ste. Marie, Contr. 9. BA 8/31. CD 9/7/61, under LB.

BUILDINGS—LB & CA

▲ **Frank Messer & Sons, Inc.**, 4612 Paddock St., Cincinnati, O., CA, TECHNICAL CENTER ADDNS., two campus type 150,000 sq. ft. PLANTS, Center Hill Rd., CINCINNATI, O. Proctor & Gamble Co., 6th and Sycamore Sts., Cincinnati, O.

▲ **T. R. Gibson**, 33 Holly Park, Mentor, O., Owner Builds, **$1,200,000**, $400,000 first year (3 year program), 30 HOMES, Holly Park Development, MENTOR, O.

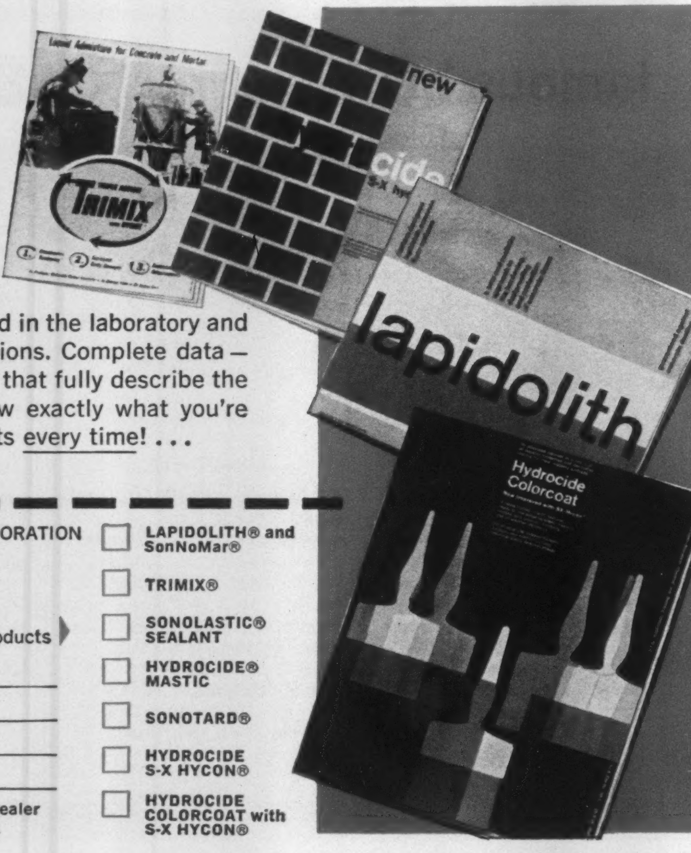
Elwill Constr. Co., 2119 S. Green Rd., South Euclid, O., Owner Builds, **$800,000**, 40 Pleasant Dream HOMES, south of Pleasant Valley Rd., between Broadview and Broaddale Rd., PARMA, O.

Schirmer-Schneider Co., 2719 Detroit Ave., Cleveland 3, O., LB **$510,000** (5 bidders), general contract STROUD ELEMENTARY SCHOOL, PARMA, O. Parma Bd. Educ., 5401 W. 54th St., Parma 29, O. BA 9/7/61. CD 8/7/61.

Martini Constr. Co., 15828 Industrial Parkway, Cleveland, O., CA Est. **$600,000**, TRUCK TERMINAL and GARAGE, Rte. 21, near Turnpike, RICHFIELD, O. Spector Freight System, Inc., 3100 S. Wolcott St., Chicago, Ill. CD 2/7/61.

▲ **Gillmore-Olson Co.**, 1873 E. 55th St., Cleveland, O., CA Est. **$1,500,000** (9 bidders), 6 story, 65,000 sq. ft. OFFICE, Center Ridge Rd., ROCKY RIVER, O. Park West Bldg. Co., 20575 Center Ridge Rd., Cleveland 16, O. BA 8/28/61. CD 8/25/61.

Bowman Constr. Co., Inc., 1837 S. Branson St., Marion, Ind., CA general contract JUNIOR HIGH SCHOOL, west of Park Side Grade School, HARTFORD CITY, IND. Bd. School Comrs., Hartford City, Ind. Total **CA $668,958;**
Liniger Co., Inc., 105 S. Washington St., Marion, Ind., plumbing and heating contract for JUNIOR HIGH SCHOOL, (Hartford City, Ind.);



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☐ **SONOTARD®**
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☐ **HYDROCIDE COLORCOAT with S-X HYCON®**

McKay Electric Co., 7671 Bluffton Rd., Fort Wayne, Ind., CA, lighting contract for JUNIOR HIGH SCHOOL, (Hartford City, Ind.);
Robbins Electric Co., Inc., 225½ S. Union St., Kokomo, Ind., CA electrical, heating, ventilating contract for JUNIOR HIGH SCHOOL, (Hartford City, Ind.). CD 12/2/60.

▲ **J. A. Ferguson Constr. Co.**, 13546 Auburn Ave., Detroit 23, Mich., LB **$974,994** (11 bidders), general contract JUNIOR HIGH SCHOOL. Pembroke and Berg Rds., DETROIT, MICH. Bd. Educ., 1354 Broadway, Detroit 26, Mich. BA 8/31. CD 8/21/61.
Mechanical Heat & Cold, Inc., 12320 Hamilton Ave., Detroit 3, Mich., LB **$489,000** (11 bidders), mechanical contr. JUNIOR HIGH SCHOOL, Pembroke and Berg Rds. (Detroit, Mich.).

MISSISSIPPI TO ROCKIES

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

September 28 Kansas   October 4 Arkansas, Missouri
October 11 Texas

STREETS AND ROADS

September 28 Colorado, Kansas   October 4 Arkansas
October 4 Missouri   October 6 Kansas
October 10, 11 Texas

▲† **Arkansas**—BA 10/11—U. S. Eng., Gay Bldg., Little Rock, BANK STABILIZATION, Little Bayou Meto, CIVENG-03-050-62-37. $1,000,000. CD 9/12/61.

† **Arkansas**—BA 10/24—U. S. Eng., Gay Bldg., Little Rock, two 6,000 KVA POWER TRANSFORMERS for Beaver powerhouse, CIVENG-03-050-62-36. $400,000. Plans deposit $1.

BUILDINGS—BA

Minn., East Grand Forks—BA 9/27—Bd. Educ. Independent School Dist. No. 595, 31,425 sq. ft. ELEMENTARY SCHOOL. $400,000. Plans deposit $25. Grosz & Anderson, 314½ DeMers Ave., Grand Forks, N. D., archts. CD 5/10/61.

Minn., Minneapolis—BA 9/29—Regents of the University of Minnesota, 404 Admin. Bldg., Zone 14, STORM and HEAT TUNNELS to Business Admin. Bldg. on Main Campus. $455,000. Plans deposit $10. Extended date. R. V. Lund, c/o owner, engr. CD 8/23/61.

Minn., North Branch—BA 10/5—Bd. Educ. Independent School Dist. No. 138, ELEMENTARY SCHOOL. $450,000. Plans deposit $35. Matson & Wegleitner, 3701 Wayzata Blvd., Minneapolis, archts. Evans, Michaud, Cooley, Hallberg & Erickson, Plymouth Bldg., Minneapolis, mech. engrs.

▲ **Okla., Oklahoma City**—BA 10/5—Kerr-McGee Oil Co., Kerr-McGee Bldg., Zone 2, 18 story OFFICE, 132 NW 2nd St., $3,000,000. Plans deposit $50. Coston-Frankfurt & Short, 323 E. Madison St., Zone 5, archts.

BUILDINGS—SLC

Tex., Houston—J. Weingarten, Inc., 600 Lockwood St., soon lets contract, 1 story, masonry, 80,000 sq. ft. SHOPPING CENTER, Westbury Square, Chimney Rock Rd. and W. Bellfork Blvd. $775,000. Lloyd & Morgan & Jones, 4605 Montrose Blvd., archts. CD 4/17/61.

Tex., Hurst—Bell Helicopter Co., Hurst, soon lets contract, two bldgs., experimental bl., 1 story, 82 x 62 ft., MFG. PLANT, 1 story and mezzanine, 202 x 62 ft. and mezzenine, 40 x 60 ft., constr. asb. siding on cemesto bd. base br., air conditioning, etc. $400,000. Don W. Kirk & Associates, 2400 Cont. Natl. Bank Bldg., Fort Worth, archts. Yandell, Cowan & Love, Fort Worth Natl. Bldg., Fort Worth, engrs.

▲ **Tex., Port Arthur**—Texaco, Inc., 1111 Rusk St., Houston, soon lets contract three 1 and 2 story, masonry, 52,800 sq. ft. RESEARCH CENTER, Phase 3. $1,000,000. Pitts, Mebane & Phelps, 1872 Calder Ave., Beaumont, archts.-engrs. CD 6/23/60.

HEAVY CONSTRUCTION—LB & CA

Claude Everett Constr. Co., Box 25082, Houston, Tex., LB **$439,000**, Proposal 2, TRANSIT SHEDS No. 24 and No. 25, HOUSTON, TEX., Harris County Houston Ship Channel Navigation Dist., 1519 Capitol Ave., Houston, Tex. BA 8/30/61. CD 8/2/61.
Hou-Tex Mfg. Co., 16007 Hempstead Hy., Houston, Tex., LB **$379,951**, Proposal 1, steel frame, metal clad, 216,000 sq. ft., floor area, for Transit Sheds No. 24 and No. 25 (Houston, Tex.).

▲ **O. R. Burden Constr. Corp.**, 6702 E. 21st St., Okla., CA **$2,484,000**, 207 mi. 6 in. PROPANE LINE, between Sweeny and Longveiw, Brazoria, SWEENY, TEX. Texas Eastman Co., Longview, Tex. Brown & Root, Inc., 35 Japhet St., Houston, Tex., engr.

BUILDINGS—LB & CA

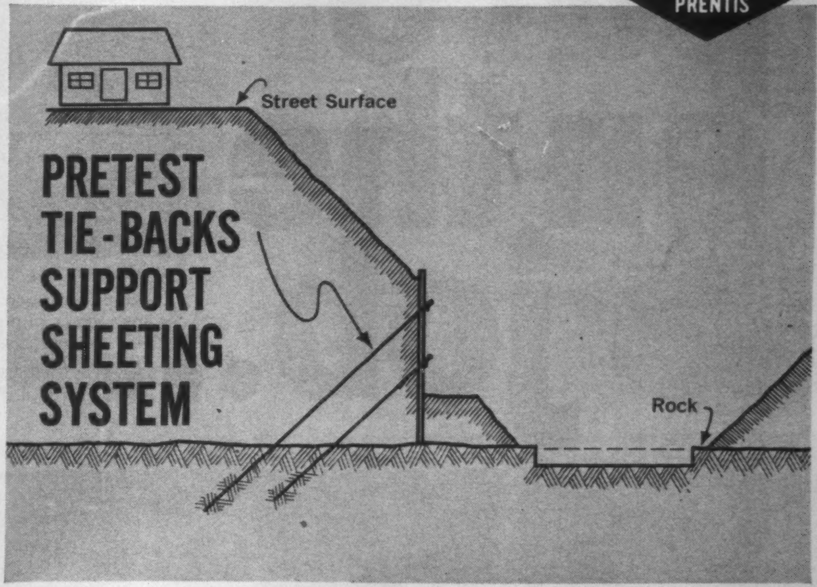
▲ **D'Arcy Leck Constr. Co.**, 2838 Stevens Ave., Minneapolis, Minn., CA **$1,500,000**, Colonial Row SHOPPING CENTER, 6 story apartment, 3 retail stores, etc. Ford Parkway between Kenneth and Howell Sts., ST. PAUL, MINN. T. F. Chapman Development Co., Highland Shopping Center, Ford Parkway, St. Paul, Minn.

▲ **McGough Constr. Co., Inc.**, 2711 Fairview Ave. N., St. Paul, Minn., LB **$2,069,900**, (6 bidders), general

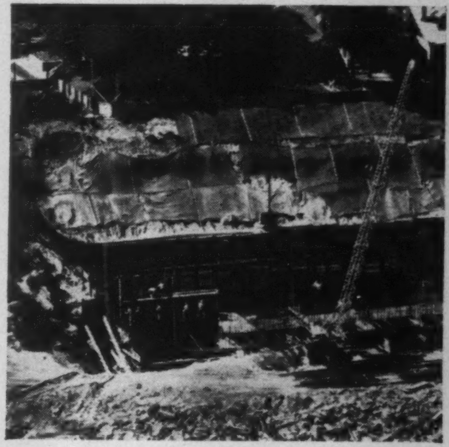
(Continued on page 250)

Owner: City of Milwaukee
General Contractor: Bauer Construction Co., Milwaukee, Wis.
Engineers: Black & Veatch, Kansas City, Mo

ANOTHER PROBLEM SOLVED BY SPENCER, WHITE & PRENTIS



NOVEL PLAN ELIMINATES NEED OF RAKER BRACING



170′ x 65′ lot is 80′ below street level.

The above-pictured system of horizontal wood sheeting and soldier beams extends 30 ft. to subgrade. It is dependably retaining a heavy earth bank, without the customary support of diagonal braces into the lot.

Instead, an unusual method supports the sheeting from the *exterior* side—by means of Pretest cable tie-backs which are socketed into bedrock, as indicated in sketch.

Developed by Spencer, White & Prentis, the tie-back method (patent app. for) has proved completely successful in one installation after another. Send for literature explaining how this method gives you a free-and-clear work area, permits savings on excavation, form work and other operations.

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These characteristics are not attainable without two-stage compression.

Fuel-thrifty, normally-aspirated engines maintain torque and power at *all* operating speeds, maintain efficiency at high altitudes.

Tandem arrangement of stages gives simple positive drive, eliminates power losses and service troubles resulting from gear or chain drives.

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Chicago Pneumatic Tool Company, 8 East 44th Street,
New York 17, N. Y.

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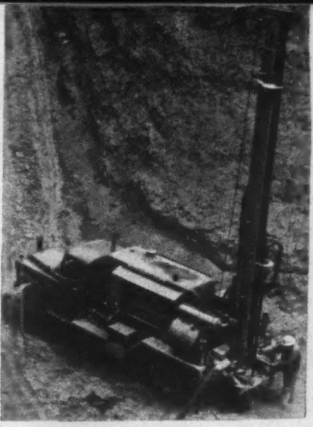

G-900 Tracdrils can drill to left or right with boom at right angles to tracks, swing a full 180° . . . shift quickly from toe holes to 11-foot high horizontals. You get more blast holes from every drilling position.

Chicago Pneumatic

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City ....Zone.....State.........

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(Continued from page 247)

contract 2 story Johnson HIGH SCHOOL, swimming pool, Arcade and East Hyacinth Sts., ST. PAUL, MINN. Bd. Educ. Special School Dist. No. 2, City Hall, and Court House, St. Paul, Minn. BA 9/12. CD 8/16/61; **Healy Plumbing & Heating Co.**, 278 W. Kellogg Blvd., St. Paul, Minn., LB **$459,400**, (5 bidders), plumbing and heating, Johnson High School (St. Paul, Minn.).

▲ **Procon, Inc.**, 1111 Prospect St., Des Plaines, Ill., CA Est. over **$1,000,000**, altering 30 story high THERMOFOR CATALYTIC CRACKING TOWER, tar separator and heater, gas plant, Pine Bend Refinery, ST. PAUL, MINN. Great Northern Oil Co., Pine Bend, St. Paul, Minn.

▲ **Forcum-Lannom, Inc.**, Clark St., Dyersburg, Tenn., LB **$2,068,000**, (6 bidders), 200 low rent HOUSING UNITS, TRUMAN, ARK. Truman Housing Auth., City Hall, Truman, Ark. BA 9/13/61. CD 8/22/61.

Bollinger Constr. Co., Braniff Bldg., Oklahoma City 2, Okla., CA **$769,467**, est. $800,000, (5 bidders), GROCERY WAREHOUSE, OKLAHOMA CITY, OKLA. Scrivner-Stevens Co., 122 E. Washington St., Oklahoma City, Okla. BA 8/31/61, CA 9/5/61. CD 8/24/61.

Benson Co., 3202 Weslayan St., Houston, Tex. CA **$400,000**, 2 story, masonry, 200 women HOUSING, 2000 Pearl St., AUSTIN, TEX. Mayfair House, 3202 Weslayan St., Houston, Tex.

Donald McGregor, et al, c/o T. J. Bettes Co., Bettes Bldg., Beaumont, Tex., rejected bids masonry, A/C, swimming pool Ramada Inn HOTEL, BEAUMONT, TEX. LB $740,000. CD 8/16/61, under LB.

▲ **Cavalier Homes Div. of Loy Constr. Co.**, 4001 Woodfin St., Houston, Tex., Owner Builds, **$5,000,000**, $2,000,000 1st year, 2½ years to complete, 200 brick DWELLINGS, Country Club, Sec. Sharpstown, HOUSTON, TEX.

Buck Hausman, Builder, 5422 Palms Center, Houston, Tex., Owner Builds **$427,250**, 36 DWELLINGS, Beverly Hills; **$448,500**, 33 all aluminum DWELLINGS, Golfview Manor, HOUSTON, TEX.

L & H Builders, 11804 Hempstead, Houston, Tex., Owner Builds, **$428,000**, 38 DWELLINGS, HOUSTON, TEX.

Mark Rice, 4040 San Felipe Rd., Houston, Tex., CA **$431,200**, 5 bldg., 51 unit, brick APARTMENT, swimming pool, East Crosstimbers St. HOUSTON, TEX. Max M. Kamin, 3900 Fernwood St., Houston, Tex. A. Carroll Broadnax & Associates, 6907 Almeda St., Houston, Tex., archts.

Marble Constr. Co., 231 Lake Park Shopping Center, Dallas, Tex., CA **$400,000**, BANK, and REMODELING, RENOVATING 3 story OFFICE, MT. PLEASANT, TEX. First National Bank, Mt. Pleasant, Tex. CD 10/7/60.

I. T. Settner Co., Bennett Estates, Pasadena, Tex., Owner Builds, **$441,000**, 31 DWELLINGS, Bennett Estates, PASADENA, TEX.

▲ **Tellepsen Constr. Co**, 1710 Telephone Rd., Houston, Tex., CA **$2,475,000**, multi-story BANK and OFFICE, PASADENA, TEX. First National Bank, 208 W. Shaw St., Pasadena, Tex. Doughtie & Porterfield, 817 S. Tatar St., and MacKie Kamrath, 2713 Ferndale St., Houston, Tex., archts. CD 11/12/59.

▲ **Unitco, Inc.**, Burbank, Calif., CA Approx. **$5,000,000** build-lease AIR DEFENSE COMMAND HEADQUARTERS (Little Pentagon) 300,000 sq. ft. parking, Bijou St., COLORADO SPRINGS, COLO. General Services Admin., Bldg. 41, Denver Federal Center, Denver, Colo.

▲ **Lippert Bros. Constr. Co.**, 1909 S. Cherokee St., Denver, Colo., CA **$1,643,343**, 1 and 2 story WOMEN'S DORMITORY, (Parmalee Hall), FORT COLLINS, COLO. Colorado State University, Campus, Fort Collins, Colo. (State Planning Comn., State Capitol, Denver, Colo.). BA 9/7/61. CD 9/13/61, under LB.

FAR WEST

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

BRIDGES

October 3, 11
October 3 Idaho   October 11 California

STREETS AND ROADS

Steptember 28 Arizona   September 29 Alaska
October 3 Idaho   October 11, 13, 18 California

† **Nev., Fallon**—BA 10/3—Dist. Pub. Wks. Office, 12th Naval Dist., Room C 112, San Bruno, Calif., SEWAGE TREATMENT PLANT, Naval Auxiliary Air Station, NBy-36034, Spec. No. 36034/61, $250,000-$500,000.

Calif., Long Beach—BA 10/6—Long Beach Harbor Dpt., 925 Harbor Plaza, Proj. 669, TRAVELLING SHIP LOADER and SUPPLY CONVEYOR, Unit No. 1. $700,000. CD 2/5/58.

▲ **Calif., San Diego**—BA 10/11—City, Rm. 161, Civic Center Bldg., Zone 1, INTERCEPTOR SEWER, Contr. 2, Sched. 11 for Sewage Collection, Treatment and Disposal Sys. $4,115,700. Plans deposit $25.

▲ **Calif., Montecito** — BA 10/16 — Montecito Sanitary Dist., Court House, Santa Barbara, SEWERAGE FACILITIES, Assessment District No. 1. $1,953,500. Plans deposit $20. Extended date. Engineering-Science, Inc., 150 E. Foothill Blvd., Arcadia, engr. CD 9/11/61.

† **Washington**—BA 10/19—U. S. Eng., City-County Airport, Walla Walla, GRADING, DRAINING, SURF. 5.6 mi. north shore access road to Lower Monumental Damsite, CIVENG-45-164-62-11, $700,000.

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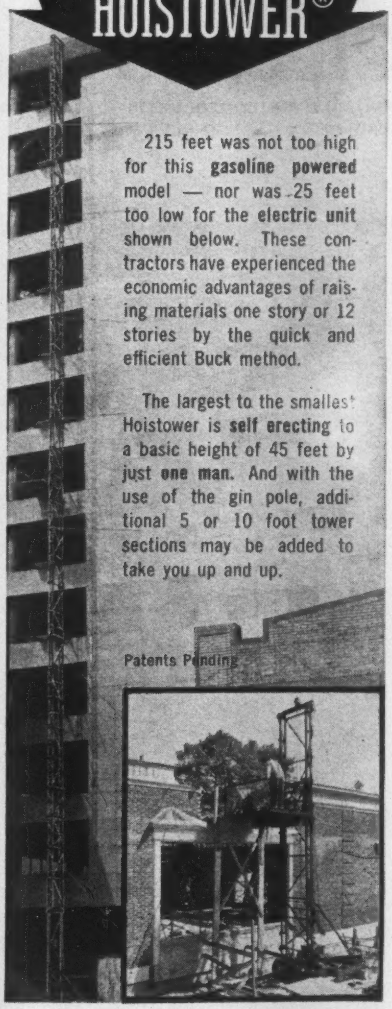

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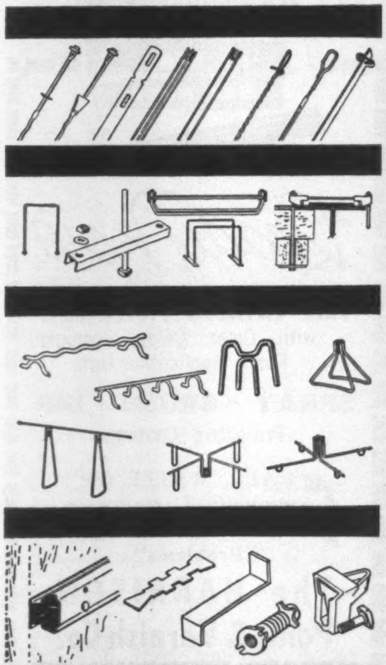

CIRCLE 62 ON READER SERVICE CARD

BUILDINGS—BA

Wash., Seattle—BA 10/3—School Dist. 1, 815 4th Ave. N., rein.-con., masonry GYMNASIUM ADDN. Garfield High School, $900,000. Plans deposit $50. Bassetti & Morse, Tower Bldg., archts. CD 5/14/59.

Hawaii, Honolulu—BA 10/12—Kuakini Hospital & Home, 347 North Kuakini St., HOSPITAL and HOME ADDNS., Proj. 20. $425,000. Plans deposit $50. Fuchino, Hara, Katsuyoshi & Onodera, 218 North Queen, Honolulu, Hawaii, archts. Hara, Katsuyoshi & Onodera, 218 N. Queen, Honolulu, Hawaii, engrs. CD 2/7/61.

Utah, Salt Lake City—BA 10/17—Granite Bd. Educ., 340 East 3545 South, Zone 15, ELEMENTARY SCHOOL, Taylorsville Gardens. $500,000. Lyle J. Rohde, 2520 South State St., Zone 15, archt. CD 5/17/60.

HEAVY CONSTRUCTION—LB & CA

ARIZONA—State Hy. Dpt., 206 S. 17th Ave., Phoenix. Bids opened 9/15, ROADS,

Western Constr. Inc., P.O. Box 1604, Phoenix, Ariz., LB **$520,454**, est. $583,779, (8 bidders), grading, draining roadway, beginning approx. 9⅓ mi. northwest junction State Rte. 279 and State Rte. 79, extending westerly over new alignment State Rte. 279, approx. 3⅓ mi. to junction State Rte. 279, Camp Verde-Bridgeport Hy., Yavapai Co. CD 8/30/61.

▲ **WASHINGTON** — State Hy. Comn., Transportation Bldg., Olympia, Bids opened 9/12, ROAD,

Wash.—**Guy F. Atkinson Co.**, 10 W. Orange Ave., South San Francisco, Calif., LB **$7,944,493**, (4 bidders), 0.729 mi. Seattle Freeway, Republican St. to E. Galer St., King Co. CD 8/8/61;

Wash.—**Fiorito Bros.**, 1100 Leary Way, Seattle, Wash., LB **$1,540,417**, paving 4.61 mi. Primary State Hy. 1, Pierce Co. Line to junction with Primary State Hy. 5, King Co. CD 8/23/61.

† **OREGON**—Bureau P. Rds., Morgan Bldg., Portland, Bids opened 9/1, ROAD,

Vernie Jarl, Box 507, Gresham, Ore., LB **$652,381**, (5 bidders), base surf., bit. paving 20.407 mi. McKenzie and Belnap Springs Hys., Lane Co. CD 8/16/61.

Riverside Constr. Co., Box 3853, Portland, Ore., LB **$302,711**, (6 bidders), 29,100 lin. ft. SANITARY SEWERS, PUMPING STATION, OREGON CITY, ORE. City, City Hall, Oregon City, Ore. BA 9/7/61. CD 8/28/61.

L. F. **Henshaw**, 260 Olive St., and **Schutt Constr. Co.**, 3421 Pattison St., both Eugene, Ore., LB **$478,400**, est. $468,800, (3 bidders), SEWAGE TREATMENT PLANT ADDNS., two PUMPING STATIONS, SPRINGFIELD, ORE. City, City Hall, Springfield, Ore. BA 9/7/61. CD 8/16/61.

▲ **CALIFORNIA**—State Div. Hys., 120 South Spring St., Los Angeles. Bids opened 9/7, ROADS,

Calif.—**E. L. Yeager Co.**, P.O. Box 87, Riverside, Calif., LB **$103,158**, (5 bidders), wid'n., reconstr. State Sign Rte. 74 between Grand Ave. and Adam Ave. about 1 mi. west of Elsinore, Riverside Co; LB **$467,507**, (4 bidders), constr. interchange on US Hy. 66-91 at Mojave Dr. in Victorville and overcrossing bridge to carry Mojave Dr. over US Hys. 66-91, San Bernardino Co.;

Calif.—**Highway Steel Constr. Co. & Metal Coating Corp.**, P.O. Box 4904, Portland, Ore., LB **$398,711**, (3 bidders), installing median barrier guard rail and signs on 11.2 mi. Santa Ana Freeway between Rosecrans Ave. in Norwalk and Grand Ave. in Santa Ana, Los Angeles and Orange Counties;

Calif.—**Warren Southwest, Inc.**, P.O. Box FF, Torrance, Calif., LB **$97,580**, (5 bidders), paving 6.7 mi. San Gabriel Canyon Rd. (State Sign Rte. 39), between Crystal Lake and Los Angeles Crest Hy. (Sign Rte. 2) at Islip Saddle, Los Angeles Co.;

Calif.—**Hooker Co.**, 11462 Penrose Ave., Sun Valley, Calif., LB **$159,326**, (3 bidders), resurf. 21.4 mi. state hy. at various locations, Los Angeles Co. CD 8/10/61.

▲ **CALIFORNIA**—State Div. Hys., 1120 N St., Sacramento, Bids opened 9/13, ROAD,

L. C. Smith Co. and Concar Rand & Enterprises, Inc., 225 19 Ave., San Mateo, Calif., LB **$4,096,371**, (7 bidders), grading, paving to constr. 2.6 mi. 4 lane freeway, State Hy. Rte. 105 between west Hillsdale Blvd. and South Delaware St., San Mateo Co. CD 8/9/61.

▲ **L. C. Smith Co.**, 225 19 Ave., San Mateo, Calif., CA SITE PREPARATION involving moving more than 1,000,000 cu. yd. earth, pouring 8,000 cu. ft. concrete roadway and installation of storm and sanitary sewers for Chevrolet Motor and Fisher Body Assembly Plant, FREMONT, CALIF. General Motors Corp., Argonaut Realty Div., General Motors Bldg., Detroit, Mich. CD 8/30/61.

▲ **Connolly-Pacific Co.**, 1925 Water St., Long Beach, Calif., CA **$1,327,312**, WHARF at Pier G, Berths 212-215, Long Beach Outer Harbor, LONG BEACH, CALIF. Long Beach Harbor Dpt., 925 Harbor Plaza, Long Beach, Calif. BA 8/30, CA 8/31. CD 9/11/61, under LB.

▲ **MacDonald & Kruse**, 3434 Verdugo Rd., Montrose, Calif., CA **$1,884,293**, 1958 STORM DRAIN BOND ISSUE, PROJ. No. 557, Norwalk, LOS ANGELES, CALIF. Los Angeles County Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 8/18. CD 8/29/61, under LB.

Montebello Sewer Co., Inc., 140 E. Whittier, Montebello, Calif., CA **$574,065**, two STORM DRAINS, Alhambra-San Gabriel Area, Proj. 573, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 8/25. CD 9/12/61, under LB.

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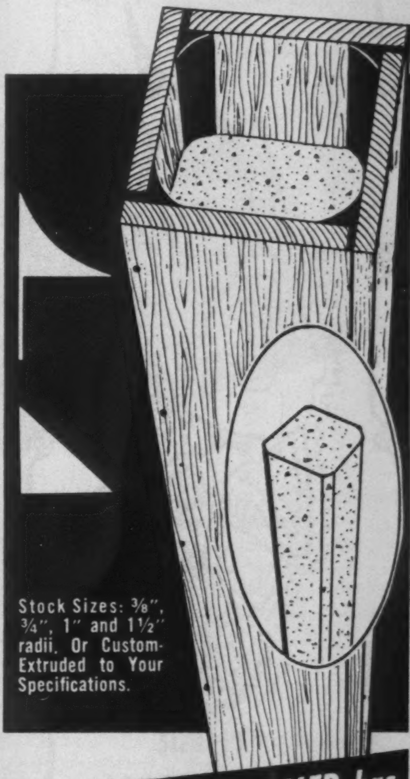

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▲ **N. P. Van Valkenburgh Co.**, 1627 Chico Ave., South El Monte, Calif., CA **$1,310,160**, Whittwood STORM DRAIN, Whittier Area, Proj. 532, LOS ANGELES, CALIF. Los Angeles Co. Flood Control Dist., 2250 Alcazar St., Los Angeles, Calif. BA 8/25. CD 9/12/61, under LB.

▲ **Shanley Constr. Co. and W. J. Nicholson**, 503 Market St., San Francisco 5, Calif., LB **$2,747,777**, (7 bidders), TRUNK LINES and SEWAGE FACILITIES, Northeast Sacramento County Sanitation Dist., Carmichael, Citrus Heights area north of here, SACRAMENTO, CALIF. Bd. Supervs. Sacramento Co., County Admin. Bldg., 827 7 St., Sacramento, Calif. BA 9/13. CD 9/6/61.

Daniels Constr. Co., 2121 Curry St., Long Beach, Calif., CA **$553,096**, Proj. P 1-5, DIGESTER No. 6 and IMPRVTS. at Plant No. 1, SANTA ANA, CALIF. Orange County Sanitation Dist. No. 1, 1104 W. 8 St., Santa Ana, Calif. BA 8/16, CA 8/18. CD 8/15/58.

BUILDINGS—LB & CA

† **Hal L. Grammer Constr. Co.**, P.O. Box 10096, Phoenix, Ariz., LB **$579,473**, est. $624,700, (7 bidders), constr. Naval and Marine Corps RESERVE TRAINING CENTER, Spec. No. 30339, PHOENIX, ARIZ. Southwest Div., Bureau Yards & Docks, 1220 Pacific Hy., San Diego 32, Calif. BA 9/12/61. CD 8/30/61.

▲ **J. H. Pomeroy & Co., Inc.**, 755 Sansom, San Francisco, Calif., CA **$3,500,000**, De Sabla POWERHOUSE, demolishing present plant, constr. new concrete structure, installing over a mile of steel penstock, 18,500 kw outdoor-type turbine generator unit, Butte Co., CALIFORNIA. Pacific Gas & Electric Co., 245 Market St., San Francisco 6, Calif. CD 4/29/60.

Chotiner & Gumbiner, 5316 Venice Blvd., Los Angeles, Calif., Owner Builds, **$496,000**, 2 RETAIL STORES 1224-1310, 1312-26 Rosecrans Blvd., Temple and Gibson Tract, COMPTON, CALIF. Novikoff Engineers, 3858 W. Santa Barbara Ave., Los Angeles, Calif., engrs.

Harbor View Hills Development Co., Goldenrod and Harbor View, Corona Del Mar, Calif., Owner Builds, **$584,050**, 24 stucco DWELLINGS, Harbor View Hill, Tract 3660, CORONA DEL MAR, CALIF.

Wm. P. Neil Constr. Co., 4814 Loma Vista Ave., Vernon, Calif., CA **$400,000**, WAREHOUSE-OFFICE, 11300 W. Playa St., Tract 9883, CULVER CITY, CALIF. Competition Motors, 1219 Vine St., Los Angeles, Calif. Paul R. Williams & Assoc., 3737 Wilshire Blvd., Los Angeles, Calif., archts.

Louetto Constr. Co., P.O. Box 543, Escondido, Calif., LB **$944,280**, (6 bidders), Del Dios HIGH SCHOOL, ESCONDIDO, CALIF. Escondido Union School Dist., 5 and Maple Sts., Escondido, Calif. BA 9/11. CD 8/30/61.

Joe Perry, 526 W. Glenoaks, Glendale, Calif., CA **$447,-000**, stucco APARTMENT, 460 W. Doran, Tract 6149, GLENDALE, CALIF. J. P. Allen, 526 W. Glenoaks, Glendale, Calif.

Flamingo Constr. Co., 1506 Robin Way, Fullerton, Calif., CA **$522,000**, 24 DWELLINGS, E. Palm Dr., E. Flamingo St., Tract 24215, GLENDORA, CALIF. Saga Development Co., 11015 Paramount Blvd., Downey, Calif.

La Vereda Co., 15630 S. Crenshaw Blvd., Gardena, Calif., Owner Builds, **$573,185**, 24 stucco DWELLINGS, Tract Addn. to Tract 3786, LA HABRA, CALIF.

Sheldon & Pollack Constr. Co., 5880 W. Pico Blvd., Los Angeles, Calif., CA **$515,000**, RETAIL DEPARTMENT STORE and CANOPY, 5500 Cherry Ave., LONG BEACH, CALIF. J. M. Arnoff Co., c/o 5880 W. Pico Blvd., Los Angeles, Calif.

H. R. Anderson, 816 Moraga Dr., Los Angeles, Calif., Owner Builds, **$650,000**, concrete OFFICE, 4032 Wilshire Blvd., LOS ANGELES, CALIF. Albert Criz, 9808 Wilshire Blvd., Beverly Hills, Calif., archt. Samuel Schultz, 377 S. Robertson Blvd., Beverly Hills, Calif., engr.

J. A. McNeil Co., 3115 W. Mission Rd., Alhambra, Calif., CA **$611,000**, 3 story STUDENT HOUSING, W. 80 St., LOS ANGELES, CALIF. Loyola University, 7101 W. 80 St., Los Angeles, Calif. BA 8/29. CD 9/11/61, under LB.

▲ **E. C. Nesser**, 4822 W. Jefferson Blvd., Los Angeles 16, Calif., CA **$2,930,356**, est. $2,700,000, George E. Hale JUNIOR HIGH SCHOOL, 23830 Califa St. (formerly California and Platte Sts.), LOS ANGELES, CALIF. Bd. Educ., 1425 S. San Pedro St., Los Angeles, Calif. BA 8/25. CD 8/15/61.

▲ **Nylin Hurd Constr. Co.**, 1317 Santiago Ave., Santa Ana, Calif., CA **$3,208,585**, HIGH SCHOOL, Jamboree St., Corona Del Mar, NEWPORT BEACH, CALIF. Newport Union High School Dist., 1601 16 St., Newport Beach, Calif. BA 8/23. CD 8/8/61.

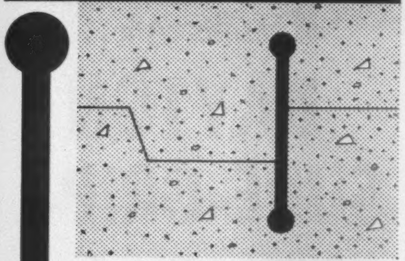
J. Korida & M. Treitel, 5967 W. 3 St., Los Angeles 36, Calif., CA **$641,600**, 39 stucco DWELLINGS, Tract 25298, Yolanda Ave., Baird Ave., Reseda Blvd., Germain and Cleymier Sts., NORTHRIDGE, CALIF. Northridge Royale, 5967 W. 3 St. Los Angeles 36, Calif.

Serious Investors, Inc., 13101 Brookhurst, Garden Grove, Calif., Owner Builds, **$490,000**, 35 DWELLINGS, Tract 3619, ORANGE, CALIF.

D. E. Schug, 1142 Deborah, Tustin, Calif., Owner Builds, **$535,650**, 36 stucco DWELLINGS, Tularosa, Tract 3964, ORANGE, CALIF.

Smythe Co., Inc., 12232 Singingwood Dr., Santa Ana, Calif., CA **$648,000**, 36 stucco DWELLINGS, 2508 Larkstone Dr., Tract 4068, ORANGE, CALIF.

WATERSTOPS
FOR MASONRY CONSTRUCTION JOINTS



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Larkstone, 12232 Singingwood Dr., Santa Ana, Calif. Thomas & Richardson, 13912 Ponderosa, Santa Ana, Calif., archts.

▲ **R. C. Mahon & Co.**, 2600 Monterey St., Torrance, Calif., LB **$1,964,378**, STRUCTURAL STEEL and STEEL DECKING for 15 story STATE OFFICE RETIREMENT BLDG., W.O. 4556GC-26, SACRAMENTO, CALIF. State Div. Architecture, 1120 N St., Sacramento, Calif. BA 9/12. CD 8/18/61.

▲ **R. J. Hortie**, 2627 Boston, San Diego 13, Calif., and **C. F. Von Gunden**, 3105 Congress St., San Diego 10, Calif., LB **$1,325,500**, (10 bidders), Albert Einstein JUNIOR HIGH SCHOOL, Conrad and Longford, Clairemont, SAN DIEGO, CALIF. San Diego Unif. School Dist., 4100 Normal St., San Diego 3, Calif. BA 9/12. CD 8/15/61.

Ronell Development Co., 16611 Ventura Blvd., Encino, Calif., Owner Builds, **$565,000**, 2 stucco APARTMENTS, 14411 Vose St., Tract 3836, VAN NUYS, CALIF. Jack Chernoff, 8690 Wilshire Blvd., Beverly Hills, Calif., archt.

▲ **Carlton Builders**, 246 S. Robertson Blvd., Beverly Hills, Calif., CA **$1,617,600**, 80 frame, stucco DWELLINGS, Tract 2947, WOODLAND HILLS, CALIF. Liberty Builders Ins. Co., Astro Land Co., 246 S. Robertson Blvd., Beverly Hills, Calif. Raymond D Conwell & Assoc., 919 S. Garfield Ave., Los Angeles 22, Calif., archts.

Allied Constr., Inc., 550 Cooke St., Honolulu, Hawaii, LB **$555,000**, Projs. B4667 & B4658, MEDICAL SURGICAL BLDG., KANEOHE, HAWAII. State of Hawaii, Dpt. Health, Punchbowl and King Sts., Honolulu, Hawaii. CD 8/17/59, under Hawaii, Honolulu.

▲ **Hawaiian Dredging & Constr.**, 1350 Ala Moana Blvd., Honolulu, Hawaii, LB **$1,520,394**, (6 bidders), Castle Memorial HOSPITAL, KAILUA, HAWAII. Windard Oahu Community Assoc., Kailua, Oahu. BA 9/7. CD 7/10/61.

CANADA

HEAVY CONSTRUCTION—BA

STATE HIGHWAY LETTINGS

STREETS AND ROADS

September 27, October 11 Ontario

Ont., Toronto—BA 9/26—Municipality of Metropolitan Toronto, 67 Adelaide St. E., 36 in., WATER MAIN, Lawrence Ave. from Duplex Ave. to city limits (W-3-61). $750,000. Plans deposit $50. CD 7/21/61.

▲ **Ont., Toronto**—BA 11/6—Toronto Transit Comn., 1900 Yonge St., approx. 2,800 lin. ft. SUBWAY STRUCTURES various sections, misc. work. Toronto-Bloor-Danforth-University Subway, Contract D-1, $3,000,000; TUNNEL SECTION, Toronto Bloor-Danforth-University Subway, incl. 2,250 lin. ft. 16 ft. diam. tunnels and bldg. short section Sherbourne St. Station Contract D-2, $3,000,000. Plans deposit $100 each. Norman D. Wilson, 128 Glen Rd. and de Leuw, Cather & Co., Canada Ltd., 52 St. Clair Ave. E., both of Toronto, consult. engrs. John B. Parkin Assoc., 1500 Don Mills Rd., Toronto, engr. W. S. Atkins & Assoc., Ltd., 33 Price St., Toronto, engr. for tunnel work. CD 5/15/59.

BUILDINGS—BA

▲ **Ont., Ottawa**—BA 9/27—University of Ottawa, Laurier Ave. E., 4 story MEDICAL EXTENSION, Laurier Ave. E., $1,350,000. Extended date. J. S. Le Fort, 86 Greenfield Ave., archt. CD 9/5/61.

▲ **Ont., Oakville**—BA 10/3—Oakville-Trafalgar Memorial Hospital Bd., rein.-con. HOSPITAL ADDNS. $1,000,000. Govan, Ferguson, Lindsay, Kaminker, Langley & Keenleyside, 10 Price St., Toronto, archts. CD 9/7/61.

▲ **Saskatchewan and Manitoba**—BA 10/12—Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont., supply, install 95 TRANSPORTABLE HOMES, STORAGE UNITS, Yorkton, Sask.; 95 TRANSPORTABLE HOMES, STORAGE UNITS, Alsask, Sask.; 95 TRANSPORTABLE HOMES, STORAGE UNITS, Dana, Sask.; 95 TRANSPORTABLE HOME, STORAGE UNITS, Gypsumville, Man. $1,000,000. Plans deposit $100.

BUILDINGS—SLC

▲ **Ont., Ottawa**—R. R. Soeurs Grises de la Croix, Maple Lane, soon lets contract, 2 story, 240x300 ft., brick, stone PENSIONAT, Maple Lane, $1,000,000. Louis J. LaPierre, 56 Sparks St., archt. CD 9/5/61.

HEAVY CONSTRUCTION—LB & CA

▲ **Peter Kiewit Sons of Canada Ltd., Al Johnson Co. of Canada Ltd., Poole Constr. Co., Ltd.**, c/o 1587 W. 8th Ave., Vancouver, B. C., LB **$4,903,750**, (8 bidders), Contract 25, TUNNEL CONTROL SHAFT SUBSTRUCTURES South Saskatchewan River Dam about 5 mi. north of Dunblane, Sask. Irrigation Project, ALBERTA. Prairie Farm Rehabilitation Admin., Motherwell Bldg., Regina, Sask. BA 9/7/61. CD 8/18/61.

Bedford Constr. Co., Ltd., 215 14th St., West Vancouver, B. C., CA **$636,000**, supply, install, 76,348 ft. 6- to 15-in. SANITARY SEWER MAINS, 325 MANHOLES, 1,350 HOUSE CONNECTIONS, BURNABY, B. C. Burnaby Municipality, Municipal Hall, Burnaby, B. C. CA 9/5/61. CD 4/4/61.

ONTARIO—Dpt. Hys., Parliament Bldgs., Downsview, Bids opened 9/6, ROADS,

Ont.—**King Paving Co., Ltd.**, Box 550, Oakville, Ont., LB **$684,103**, grading, drainage, granular base, hot mix paving, bridges, 4.61 mi. Hy. 41, Courtice Rd. Interchange, Hold Rd. Bridge, Waverley Rd. interchange and service road westerly (61-24), Chatham. CD 8/14/61.

Ont.—**Sterling Constr. Co., Ltd.**, Box 188, Walkerville, Ont., LB **$272,674**, grading, drainage, granular base, 7.26 mi. Development Rd. 471 from Inwood County Road to Hy. 21 (61-183), Chatham.

V. K. Mason Constr. Ltd., 737 Richmond Rd., Ottawa, Ont., LB **$743,000**, HEATING PLANT ADDN., Tunney's Pasture, OTTAWA, ONT. Dpt. P. Wks., Sir Charles Tupper Bldg., Ottawa, Ont. BA 9/6/61. CD 8/8/61.

Bedford Constr. Co., Ltd., 60 Harbor St., Toronto, Ont., CA **$694,000**, Highland Creek SEWAGE TREATMENT PLANT EXTENSION, (D-12-61) TORONTO, ONT. Municipality of Metropolitan Toronto, 67 Adelaide St. E., Toronto, Ont. BA 8/24/61. CD 8/30/61, under LB.

▲ **Dufferin Constr. Co., Ltd.**, 2700 Dufferin St., Toronto, Ont., LB **$1,018,315**, (7 bidders), PARKING APRON, Toronto International Airport, TORONTO, ONT. Dpt. Transport, Hunter Bldg., Ottawa, Ont. BA 9/7/61. CD 8/25/61.

▲ **Redfern Constr. Co., Ltd.**, 88 Laird Dr., Toronto, Ont., CA **$2,523,700**, 1 story, 505x580 ft., steel, brick, concrete block EXHIBITION BLDG., TORONTO, ONT. Canadian National Exhibition Assocs., Queen Elizabeth Bldg., Exhibition Park, Toronto, Ont. BA 8/29/61. CD 9/7/61, under LB.

QUEBEC—Provincial Dpt. Roads, Parliament Bldgs., Quebec City, ROAD,

Cyprien Gagnon Ltee, 183 Blvd. Bernard, Box 224, Drummondville, Que., CA **$658,712**, grading, gravelling 5.35 mi. Trans-Canada Hy. (Q. E.-8), Ste. Anne du Sault, Arthabaska Co. CD 7/27/61, under LB.

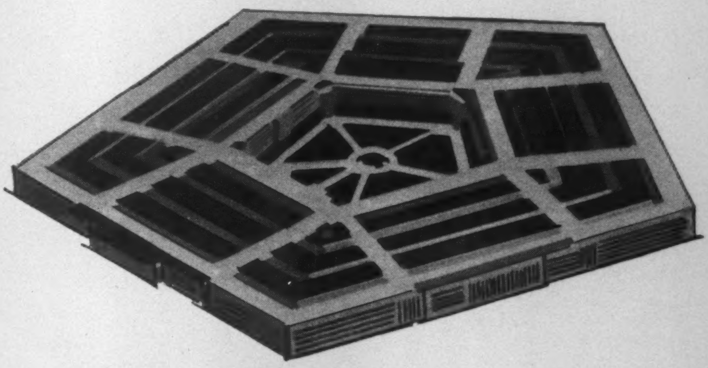
QUEBEC—Provincial Dpt. Roads, Parliament Bldgs., Quebec City, ROAD,

North Shore Builders Ltd., les Escoumains, Que., CA **$999,707**, grading, gravelling 8.63 mi. Trans-Canada Hy., St. Louis de Blandford Co., Arthabaska (Q. E. 16). CD 8/4/61, under LB.

▲ **Janin Constr. Ltd.**, 7085 Cote des Neiges Rd., Montreal, Que., LB **$2,830,000**, designing, mfg., assembling, erecting SPECIAL EQUIPMENT for transportation of concrete by cables for constr. at Manicouagan 5 of concrete multiple arch reservoir dam, Manicouagan QUEBEC. Quebec Hydro-Electric Comn., 107 Craig St. W., Montreal, Que. CD 10/21/55.

C. Duranceau Ltee, 2545 Jacques Hertel St., Montreal, Que., LB **$707,346**, VIADUCT and ABUTMENT, Sections 3, 4, 5 and 6, Champlain Bridge Approaches, MONTREAL, QUE. National Harbors Bd., Hunter Bldg., Ottawa, Ont. BA 9/7/61. CD 8/30/61.

(Continued on page 257)



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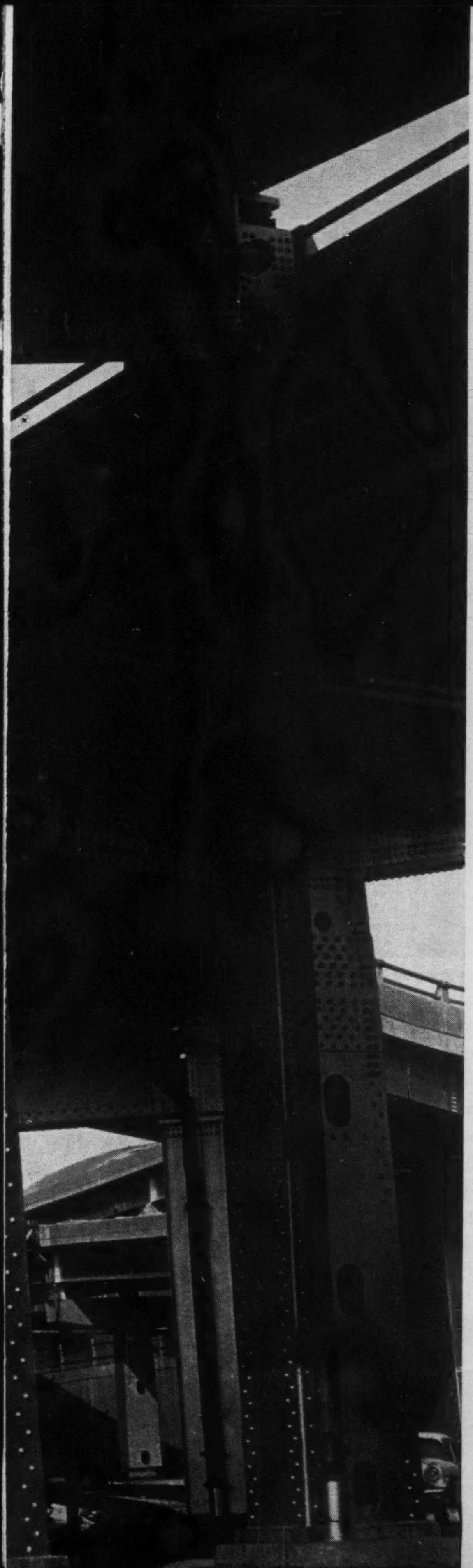

This boulevard says STEEL in a big way

USS MAN-TEN High Strength Steel combined with A7 carbon steel cuts weight and reduces costs

Pittsburgh's new Crosstown Boulevard begins at one of the busiest spots in town—the elevated intersection of the Boulevard of the Allies and the approach to the Liberty Bridge. It crosses over two railroad spurs and two heavily traveled thoroughfares before reaching grade near the sports arena.

Here is another case where the use of USS MAN-TEN (A440) High Strength Steel combined with A7 carbon steel resulted in substantial economies and less weight.

The designers and engineers, Richardson, Gordon and Associates, had already used USS MAN-TEN (A440) Steel in the Penn-Lincoln Parkway to reduce weight of members by 23% to 29%. Costs went down, too, because USS MAN-TEN (A440) Steel is cheaper than structural carbon steel when weight reduction is 17% or more. MAN-TEN Steel's high yield point of 50,000 psi permits designing to permissible allowable stresses of 24,000 compared to 18,000 psi for A7 steel.

The Crosstown Boulevard is a good example of how you can combine A7 steel with USS MAN-TEN (A440) structural shapes and built-up sections for economical short-span bridge construction. In all, 1,554 tons of USS MAN-TEN High Strength Steel were used on this project and consisted of 36″ WF beams, angles and plates. The riveted built-up sections shown were fabricated from USS MAN-TEN Steel plates and angles. Webs are 54½″ deep.

United States Steel also makes A36 (36,000 psi, minimum yield) structural carbon steel, USS COR-TEN and USS TRI-TEN Brands High Strength Steel (50,000 psi minimum yield point), and USS "T-1" Constructional Alloy Steel (100,000 psi minimum yield strength). For more information, write United States Steel, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS, MAN-TEN, COR-TEN, TRI-TEN and "T-1" are registered trademarks.

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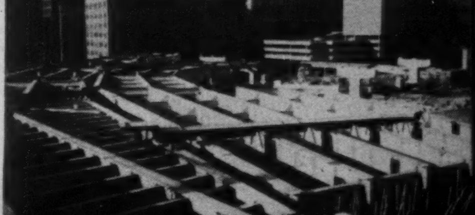
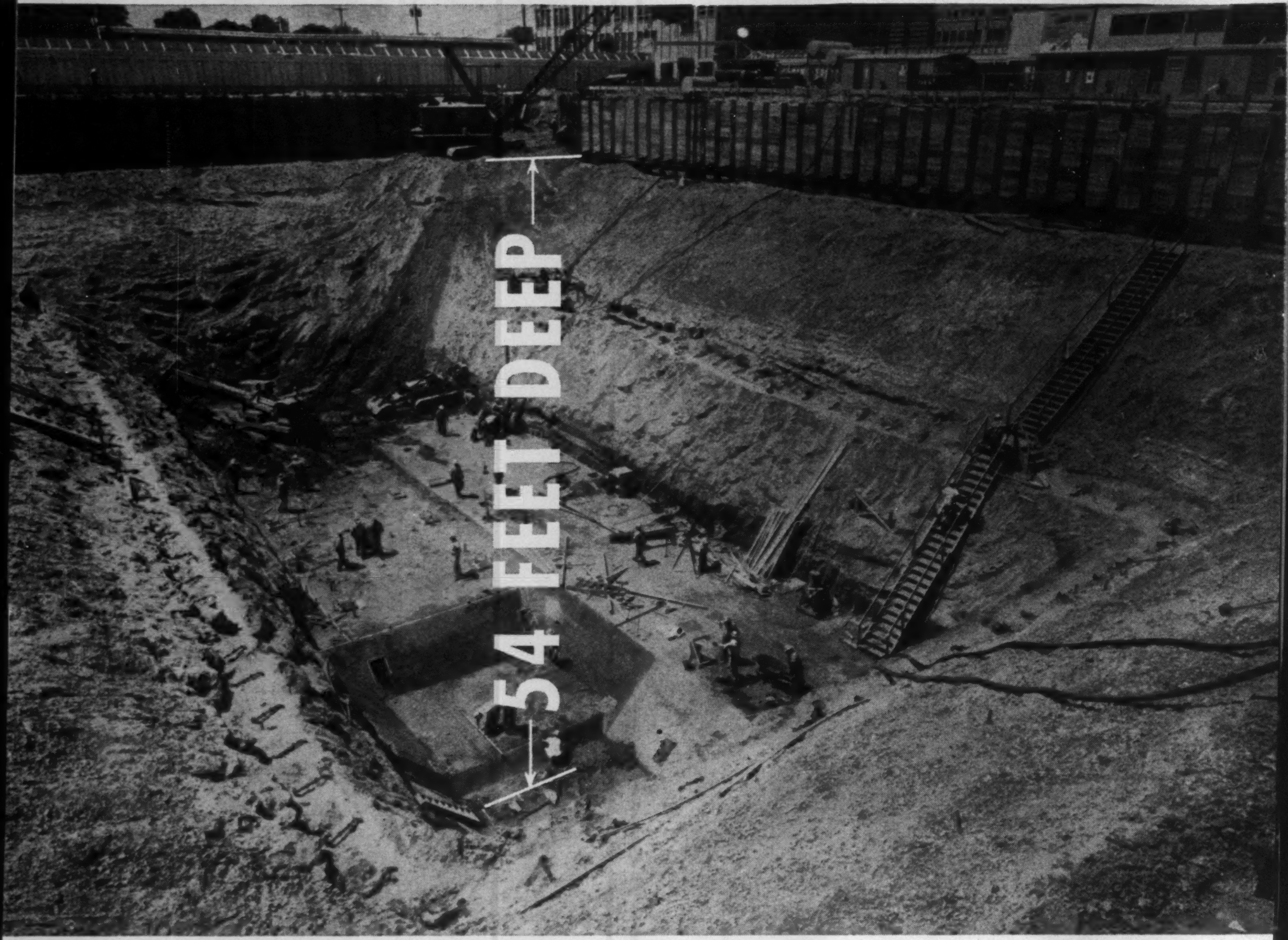
Pittsburgh Crosstown Boulevard

Owner: Pennsylvania Department of Highways, Harrisburg, Pennsylvania. Designer: Richardson, Gordon and Associates, Pittsburgh, Pennsylvania. Superstructure General Contractor: Pittsburgh Bridge & Iron Works, Pittsburgh, Pennsylvania. Substructure General Contractor: Sanctis Construction, Inc., Pittsburgh, Pennsylvania.



MORETRENCH PUMPING BONEDRIES FOUNDATION



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←CIRCLE 256 ON READER SERVICE CARD

(Continued from page 253)

Monette Sand & Gravel Co., Ltd., 2190 Blvd. Gouin E., Montreal, Que., LB **$459,790,** 48 in. rein.-con. WATER MAIN, 12 in. DUCTILE IRON PIPE, Notre Dame St.; LB **$192,251,** WATER MAIN, concrete pressure pipe, Viau St., MONTREAL, QUE. City, City Hall, Montreal, Que. CD 4/21/60.

Robb Constr. Co., Ltd., 1235 Albert St., Regina, Sask., CA **$500,000,** 44 mi. GAS TRANSMISSION LINE between Hatton and Success, SASKATCHEWAN, Saskatchewan Power Corp., 1739 Cornwall St., Regina, Sask. BA 8/7/61, CA 9/7/61. CD 8/1/61.

BUILDINGS—LB & CA

Poole Constr. Co., Ltd., 2402 2a St. S.E., Calgary, Alta., LB **$990,000,** HOSPITAL ADDN., HIGH PRAIRIE, ALTA. Sisters of Charity of Providence, Lacombe Home, Midnaporte, Alta. J. A. Cawston & Assocs., 346 23rd Ave. S.W., Calgary, Alta., archts. CD 2/17/55.

Trident Constr. Ltd., St. Boniface, Man., CA Est. **$500,000,** Lord Wolseley HIGH SCHOOL, EAST KILDONAN, MAN. East Kildonan School Dist. No. 4, Munro and Roch Sts., Winnipeg, Man. Smith, Carter, Searle Assocs., 65 Dewdney Ave., Winnipeg, Man., archts. BA 8/17/61. CD 5/5/61.

Owner, c/o David Slater Ltd., 806 Childs Bldg., Winnipeg, Man., Owner Builds, **$900,000,** 6 story, APARTMENT, Lannark St., WINNIPEG, MAN.

Cameron Contracting Ltd., 313 Bayers Rd., Halifax, N. S., LB **$715,970,** (5 bidders), OFFICERS BLOCK, Canadian Naval Base, HALIFAX, N. S. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. BA 9/7/61. CD 9/1/61.

▲ **J. Kleinstein,** 1087 Birchview Ave., Oakville, Ont., Owner Builds, **$2,000,000,** structural steel SHOPPING PLAZA, Lakeshore Rd. near Hampton Heath Rd., BURLINGTON, ONT. Gordon Urwin, 142 Colborne St. E., Oakville, Ont., archt.

▲ **C. Fidani & Sons,** 224 Norseman St., Toronto, Ont. CA Est. **$1,000,000,** 1 story, masonry, steel DEPARTMENT STORE, near No. 20 and No. 8 Hys., HAMILTON, ONT. Towers Marts of Canada Ltd., 99 Avenue Rd., Toronto, Ont.

▲ **Frid Constr. Co., Ltd.,** 605 James St. N, Hamilton, Ont. CA **$3,817,000,** first stage, SCHOOL for DEAF CHILDREN, incl. 1 story JUNIOR SCHOOL, HOSPITAL ADMIN., LAUNDRY and BOILER PLANT BLDGS., 8 story steel frame, brick STAFF RESIDENCE, MILTON, ONT. Dpt. P. Wks., Parliament Bldgs., Toronto, Ont., BA 8/23/61 CD 8/29/61, under LB.

▲ **Robertson Yates Corp., Ltd.,** Box 301, Hamilton, Ont., CA Est. **$4,000,000,** 2 wing, 1,900,000 cu. ft. structural steel, brick, stone HOSPITAL ADDN., incl. 6 story with 2 story penthouse main wing and 5 story wing, SAULT STE. MARIE, ONT. General Hospital Bd., Plummer Memorial Hospital, Queen St. E., Sault Ste. Marie, Ont. BA 8/29/61. CD 8/21/61.

▲ **Camston Ltd.,** 505 Eglinton Ave. W., Toronto, Ont. CA Est. **$3,000,000,** 12 story, rein.-con. aluminum plate glass, brick, precast concrete, air conditioned PUBLISHING PLANT, TORONTO, ONT. Encyclopaedia Britannica of Canada Ltd., 207 Queen's Way W., Toronto, Ont. Harry B. Kohl, 491 Lawrence Ave. W., Toronto, Ont., archt.

▲ **E. G. M. Cape & Co., (1956) Ltd.,** 79 Scollard St., Toronto, Ont., CA **$3,938,663,** (12 bidders), 11 story, 2 bsmnts., HOSPITAL EXPANSION, 3 floor CENTER WING ADDN., TORONTO, ONT. Hospital for Sick Children, 555 University Ave., Toronto, Ont. BA 8/30/61. CD 9/6/61, under LB.

Milne & Nicholls Ltd., 57 Bloor St. W., Toronto, Ont., CA Est. **$625,000** four 1 story, 32,000 sq. ft., 12,000 sq. ft. two 15,000 sq. ft. steel frame WORKS BLDGS., TORONTO, ONT. Twp. of North York, 5000 Yonge St., Toronto, Ont. CD 4/14/61, under LB.

▲ **Tellier & Groleau, Inc.,** 2391 Place de Vaudreuil, Three Rivers, Que., CA **$1,381,000,** DORMITORY, SCHOOL, Abitibi Agency, LA TUQUE, QUE. Dpt. P. Wks., Sir Charles Tupper Bldg., Ottawa, Ont. CA 9/8/61. CD 8/15/61, under LB.

U. S. POSSESSIONS

HEAVY CONSTRUCTION—BA

Samoa—BA 10/12—Govt. American Samoa, c/o Belt, Lemmon & Lo, engrs., Hawaiian Life Bldg., Honolulu, 9,000 ft. JET RUNWAY, TAXIWAY and PARKING AREA, PAVING 14 mi. road between Tafuna Airport and Breakers Point, Tafuna. $450,000. Plans deposit $25. CD 6/15/59.

AMERICANS ABROAD

HEAVY CONSTRUCTION—BA

▲† Vietnam—BA About 10/20—International Cooperation Administration, 815 Connecticut Ave. N.W., Wash. 25, D. C., ROAD,

22 km. two lane bit. surfaced hy., steel or concrete bridges, concrete culverts, Rte. 1, Ninh Hoa and Nha Trang and between Saigon and Banmethuot, IFB-C 1030 Proj. 2. $3,000,000. Plans deposit $50.

† B. W. I., **Bahamas**—BA 10/17—Area P. Wks. Office, Caribbean, U. S. Naval Station, San Juan, Puerto Rico, 9,500 sq. ft. rein.-con. or concrete block and masonry LABORATORY ADDN. to Terminal Equipment Bldg., U. S. Naval Facility, Eleuthera, Contr. NBy 31712, Spec. No. 31712/61. $250,000-$500,000.

For additional reports see CONSTRUCTION DAILY, REPORTS SECTION

(Proposal Advertisements see pp. 265 to 267)

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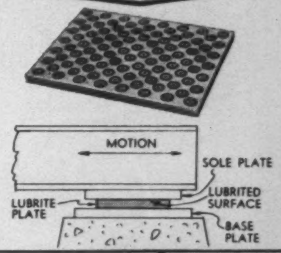

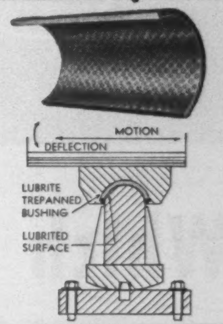

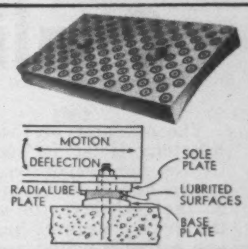

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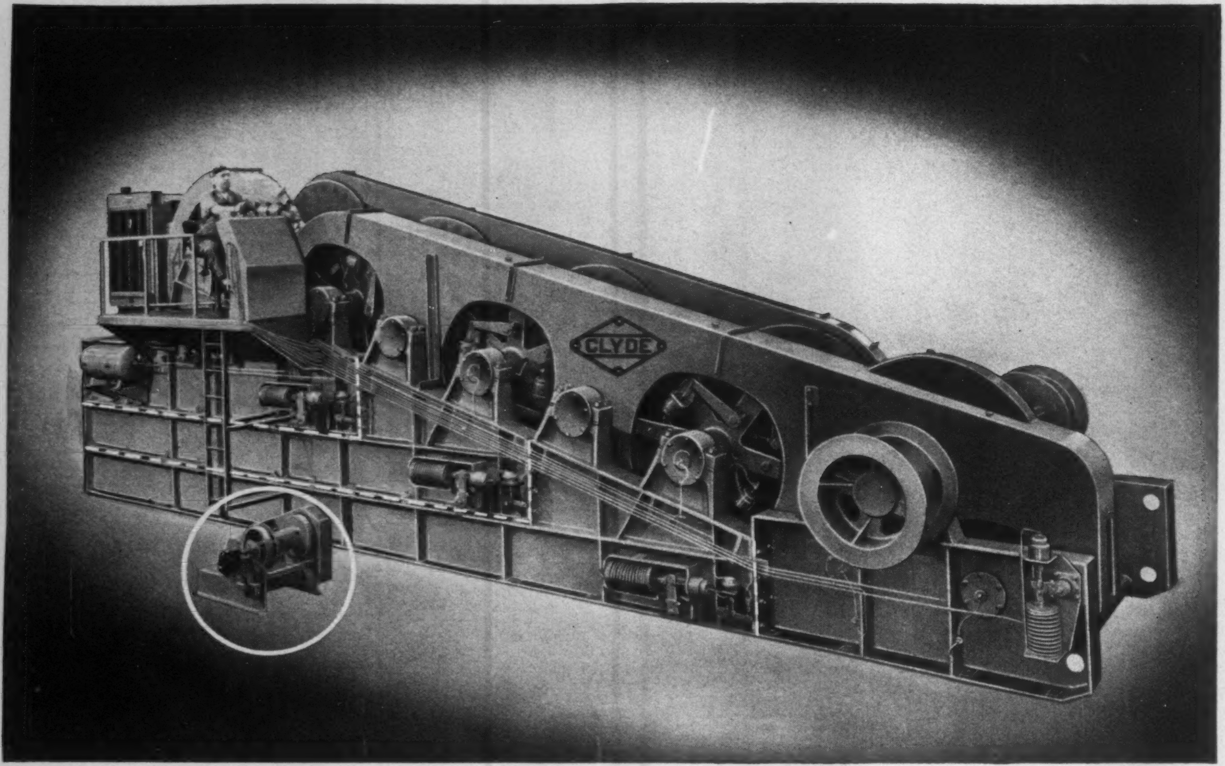
CIRCLE 257 ON READER SERVICE CARD



Which one of these two Clyde Quality Hoists is Portable?*

The operator of the Clyde Frame-12, 4-Drum Erectors Hoist is 'master of all he surveys!' Gentle, but responsive, controls at his fingertips safely handle the 42,000 pound line pull. Even on the 10th layer or with 3,000 feet of cable on the drum this unit has a 30,000 pound line pull and a 25,000 pound pull at 36 feet per minute on the 2-drum bull wheel swinger.

It was designed and built for Harris Structural Steel Company, Inc. of New York City, for use on the Brooklyn-Narrows bridge.

The hoist is sectionalized so that it can be used as a 2-, 3-, or 4-drum unit. Height and width both exceed 12 feet and it is almost as long as a city lot is wide . . . 39 feet 3¾ inches! Total weight is slightly more than 61 tons! !

***BOTH OF THEM!** Though dramatically different in size, the two Clyde Hoists shown in the illustration above are both portable.

The Frame-12 Hoist is thought to be the largest portable construction hoist in the world. Portability is not the only common denominator of the two hoists shown. Both proudly carry the Clyde trademark, assurance and acceptance of the finest engineering, quality workmanship and rugged construction that have made Clyde hoists famous around the world. The smaller hoist? It's a Clyde Frame-3 Hoist with a 3,000 pound line pull . . . all muscle, all might . . . all Clyde!

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Write for Bulletin 34

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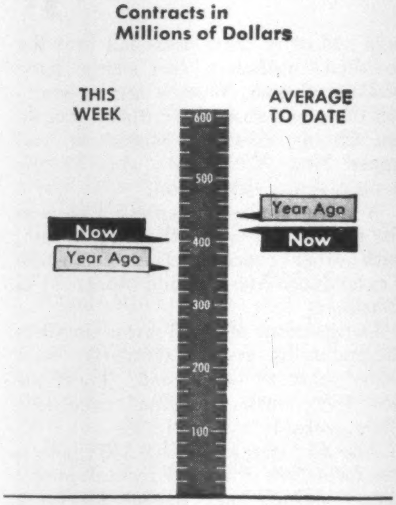
CIRCLE 258 ON READER SERVICE CARD

Construction Scoreboard

This Week . . .



AMOUNT OF CONTRACTS LET

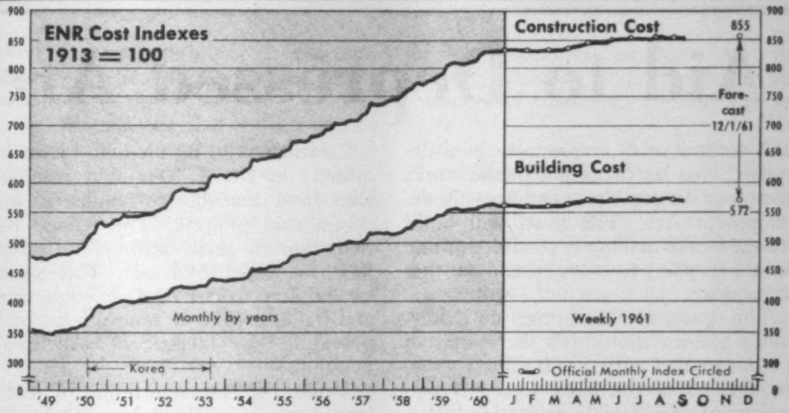
Contracts Awarded In 50 States By Type	This Week	Cum. 38 wks 1961	Chge '60-'61
	millions		%
All Heavy Construction	$399.5	$16,224.6	— 3
By Ownership			
PRIVATE	219.0	7,876.0	—12
PUBLIC	180.5	8,348.6	+ 6
State & Municipal..	149.0	6,462.8	+ 6
Federal	31.5	1,885.8	+ 4
By Type of Work			
PUBLIC			
Waterworks	5.0	287.6	—15
Sewerage	23.8	561.0	+31
Bridges*	12.0	478.4	—21
Highways	46.7	2,806.0	+13
Earthwork, Dams & Waterways	10.0	603.6	+ 1
Buildings:			
Excl. Housing ...	40.7	1,972.6	+ 9
Housing	13.4	629.3	+20
Unclassified	28.7	1,010.6	— 9
PRIVATE			
Buildings:			
Mass Housing ...	126.4	3,634.9	—16
Commercial	45.0	1,922.3	+ 5
Industrial	41.5	2,004.6	— 4
Unclassified	6.3	313.7	—52

*Includes Private bridges

NOTE: Minimum size projects included are: Waterworks and waterways, $53,000; other public works, $88,000; industrial buildings, $110,000; other buildings, $400,000.

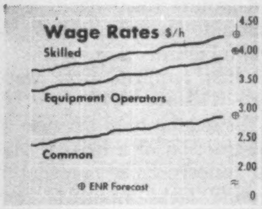
NEW CONSTRUCTION CAPITAL

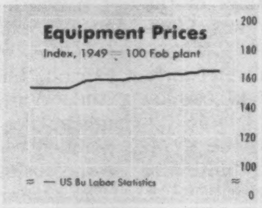
	Week of Sept. 14	Cum. 37 wks 1961	Chge '60-'61
	millions		%
Corporate Securities.	$ 38.9	$2,401.3	+10
State and Municipal:			
All Except Housing	92.1	4,720.8	— 1
Housing	0.9	98.9	—47
Federal Loans	0.9	188.7	+50
Federal Aid	79.4	3,065.5	+13
Total Nonfederal ..	$207.6	$10,400.3	+ 5
Federal Appropriations:			
Projects in U.S....	245.5	514.1	—80
Outside U.S.	0	2.3	—99
Total New Capital..	$453.1	$10,991.6	—13

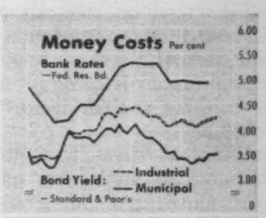


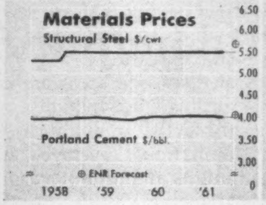
ENR INDEXES (1913 = 100), 20-cities average	Week of Sept. 14 1961	% Change from Aug. 17 1961	% Change from Sept. 15 1960
Construction Cost	853.30	—0.1	+2.8
Building Cost	570.83	—0.1	+1.6

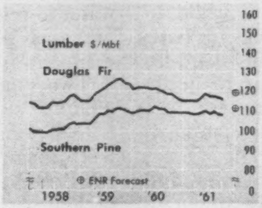
To convert above indexes to 1926 = 100: Divide Construction Cost by 2.080; Building Cost by 1.850. 1949 = 100: Divide Construction Cost by 4.770; Building Cost by 3.518.

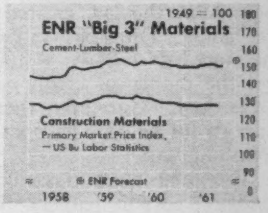












MATERIALS SHIPMENTS

	1961 July (Jl) June (J)	1961 Cum. (No. of Mos.)	% Chg. from Year Ago Mo.	% Chg. from Year Ago Cum.
Portland Cement, Bur Mines....thous bbls	31,753(Jl)	71,733(7)	− 3	+ 1
Concrete Paving Awards, PCA. thous sq yd	9,041(Jl)	64,298(7)	−15	+ 5
Fabricated Structural Steel......thous tons	287(Jl)	2,146(7)	−15	− 1
Bookings, AISC..............thous tons	456(Jl)	2,315(7)	+51	+32
Reinforcing Bars, Net, AISI.....thous tons	224(Jl)	1,405(7)	+23	+15
Lumber, total NLMA.............mil fbm	2,598(Jl)	18,739(7)	−0.3	−11
Production, total...............mil fbm	2,509(Jl)	18,227(7)	− 7	−13
Orders, total...................mil fbm	2,586(Jl)	18,948(7)	− 2	− 5
Douglas Fir.............mil fbm	594(Jl)	4,574(7)	− 8	− 2
Southern Pine...........mil fbm	522(Jl)	3,835(7)	+ 4	− 2
Unfilled Orders, Douglas Fir.....mil fbm	499(Jl)	496(7)*	− 3	−17*
Southern Pine.....mil fbm	213(Jl)	238(7)*	+ 5	+17*
Clay Products, Bureau of Census				
Brick, Unglazed, Common, Face..mil bri	641(J)	2,949(6)	− 7	− 5
Vitrified Clay Sewer Pipe.....thous tons	179(J)	825(6)	− 6	− 5
Structural Tile, Unglazed.....thous tons	40(J)	218(6)	−14	−13
Asphalt Products, Bureau of Census				
Asphalt Roofing..........thous sales sqs	7,132p(J)	25,856p(6)	+18	+ 2
Asphalt Siding...........thous sales sqs	75p(J)	359p(6)	+ 4	+ 1
Aluminum, Wrought, Net, Bur Census				
Sheet and Plate (non-heat treatable)....................mil lbs	116p(J)	624p(6)	+ 1	− 1
Wire and Cable..................mil lbs	31p(J)	166p(6)	+ 5	+12
Extruded Shapes (soft alloys).....mil lbs	85p(J)	419p(6)	+14	+ 2

EMPLOYMENT AND FAILURES

Contract Const Employment, BLS...thous	3,094(Jl)	2,658(7)*	−0.2	−0.2*
Contractor Failures, Dun & Bradstreet				
Number..............................	196(Jl)	1,665(7)	+ 2	+13
Liabilities.......................thous	$13,786(Jl)	$105,032(7)	+25	+ 9

* Average per month p = preliminary figures

Aid to Depressed Areas Picks Up

A second small community in a depressed area last week got public works assistance under the new Area Redevelopment Act. The town will build sewage works making it possible for one industrial plant to move in and another to expand.

The town is Cambridge on Maryland's eastern shore. It's the center of a labor market with 1,600 jobless workers, 11.6% of the labor force. A federal grant of $159,975 and a low interest, 40-year loan of $53,325 buys the town a sewage works that in turn will bring in a million-dollar food plant employing 225 persons and allow a publishing plant expansion that will add another 425 jobs.

First town to take advantage of the depressed areas legislation was Gassville, Ark. (ENR Aug. 3, p. 57). There, federal money is going for a waterworks as bait for a shirt factory to employ 1,000.

President Kennedy signed the $394-million depressed areas aid bill some five months ago, but it has taken the new ARA the law created a while to get going. Director William L. Batt, Jr., and his staff are working hard to get the money or credit out to needy areas first. Currently there are 112 appeals for help under consideration in Washington.

The projects in Gassville and Cambridge illustrate part of the program which permits ARA to disburse up to $100-million in loans from a revolving fund, and provide outright grants up to $75-million in the next four years for community facilities that will create new jobs.

To be approved, such projects must lead directly to the construction of a new plant of business, or the expansion of an existing one. The projects must be part of a broad program for upgrading the area. All other sources of financing, private and public, must be tapped before ARA will step in. "We're a court of last resort," says one federal official.

Since loans for the total cost of a project, plus grants, are available for community facilities, this part of the program, at the start, at least, is more popular than loans available directly for industrial and commercial projects.

The local redevelopment agencies will soon learn that funds for grants and 100% loans are limited. "They will have to exhaust their own resources to get them," an ARA official says.

Consequently, he predicts increasing interest in the $200-million revolving loan fund available for industrial and commercial projects. The federal participation in these projects is limited to 65% of the total cost. This money can be used to buy land, or equipment, and build, expand or renovate factories, providing the investment will create new jobs.

Under the commercial and industrial loan program, a West Virginia lumber company wants ARA help to provide capital for a furniture-parts factory; Clarksburg, W. Va., seeks a print factory; and a Florida town dependent on shrimping wants to can trash fish, now thrown out, and sell it to a mink farm.

A South Carolina town needs assistance in expanding its water supply system for manufacture that wants to expand, but first requires more water. And Warren County, Ga., sent an urgent plea for federal help because the planned construction of a branch plant for a Boston concern faces cancellation. The community lacks financing for a water tower, street paving, a storm sewer and a gas line, which the town told the company it would provide.

Two types of distressed areas are eligible for aid—surplus labor market areas with a long history of unemployment well above the national average, and rural areas adjudged depressed because of low personal income levels.

Some 129 labor market areas, comprising 241 counties with a total population of 19.4 million can get federal help. Most of these areas fall into the so-called "anthracite belt"—large parts of Pennsylvania, West Virginia, southern Ohio and eastern Kentucky. Southern Illinois, northeast Minnesota, and upper New York State also fit the depressed area description.

A string of eligible depressed areas in the rural group crosses the Deep South, with other concentrations in eastern Texas, New Mexico, and upper Wisconsin.

Designation of rural areas involves judgment by several standards, with many more to be defined. There are now 488 counties so defined; eventually there probably will be 1,000.

The first step in getting ARA help is the formation of a local redevelopment agency, which may be set up for a town, a county, or a group of counties considered distressed.

Chambers of commerce, generally the most familiar with local employment problems, usually take the lead in forming these local organizations. The redevelopment groups consist largely of local businessmen, but ARA insists on the broadest representation possible. Gassville, for example, has a banker, a gasoline jobber, an electric utility executive, a state assemblyman, and an agricultural extension agent on its redevelopment council.

The local group must appraise the area's economic condition and prospects, and come up with an over-all development plan ARA finds realistic.

The agency discourages grandiose

Makers Blast JFK Plea on

The steel industry gives no clear indication that it will bend to political pressures in determining the price of its products. Top steel executives flatly rejected Administration charges that increases in steel prices cause inflation.

In doing so, the executives left the companies free to adjust prices if marketing and cost factors so dictate. None, however, indicated what course of action his company would follow.

The steel makers responded to a letter sent by President Kennedy to the chief executives of 12 steel corporations. The President's letter said that in the years preceding 1958, rising steel prices "provided much of the impetus to a damaging inflation of the American economy." He asked that the producers hold the present price line, despite the wage increase scheduled to become effective October 1 under contracts signed in January, 1960.

He argued that a rise in steel prices would "force price increases in many industries and invite price increases in others."

The reply refused to admit the President's premise, nor others of his statements that included estimates of 7 to 9% profits on investment.

Roger M. Blough, chairman of number-one producer, U. S. Steel Corp. replied, "if you seek the causes of inflation in the United States, past present or future, you will not find them in the levels of steel prices or profits."

Of eight replies, the four made pub-

Momentum

visions of an industrial complex in a small town.

Thus far, over-all plans have been approved for 37 areas in 180 counties, and 48 other plans in 89 counties, are being appraised. Specific projects proposed later fit in with the concept of the broad plan.

Grants totaling $4.5 million per year have been authorized to help the local groups come up with feasible plans.

While attempting to push grants and loans out to distressed areas as quickly as possible, Mr. Batt and his fledgling agency are trying to avoid the traps that can quickly embroil them in controversy.

Areas not getting help will be alert to pirating of their own industry, and unions will keep a sharp eye on the possibility of runaway shops.

In fact, the Gassville plan came in for some criticism on the runaway shop issue. Some sources charged that the shirt factory was locating there to escape organized labor.

Each project is carefully studied to be sure that the business or industry it will bring doesn't rob another area. But there is frequently the risk that facilities built to stimulate a specific new company, or the expansion of an old one, will later contribute to another company relocating.

When branch manufacturing operations are built with ARA help, there isn't any guarantee that the branch won't expand at the expense of operations in another part of the country.

Steel Prices

lic plainly indicated anger and alarm. The executives showed anger because the President publicly warned them against raising prices. They showed alarm at the implications contained in the President's statement that a steel-price boost could "require the adoption of restrictive monetary and fiscal measures."

Avery C. Adams, chairman of Jones and Laughlin Steel Corp., the nation's fourth largest steel company, bluntly stated the President was looking toward price controls. He said: "Your proposal that steel prices be frozen is a major step toward price-fixing by government decree and constitutes dangerous impairment of our economy."

And to a man, the steel executives took vigorous exception to the estimates of profit that the industry would achieve this year.

Mr. Blough said that the President's advisers, (the Council of Economic Advisers) by choosing to measure profits in terms of return on reported net worth, did more to confuse than clarify the issue "in the light of the eroding effects of inflation on investments in steelmaking facilities over the past 20 years." He said if today's 50-cent profit dollars are compared to the 100-cent dollars invested 20 years ago, "the resulting profit ratio can hardly be said to have any validity."

To be meaningful, any comparison of profits as a percent of net worth would have to be adjusted for the effects of inflation, Mr. Blough said. He added that on this basis, U.S. Steel's return on investment over the past 10 years has averaged about 3% and at its highest point was 5.1%.

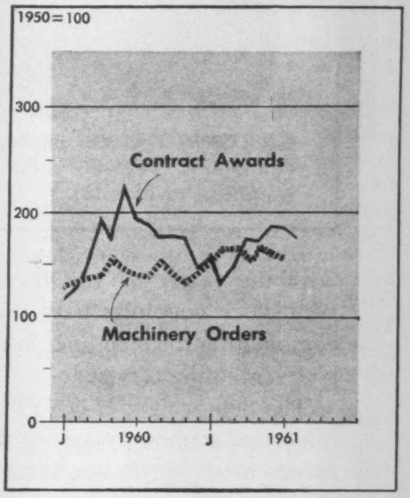
Thomas F. Patton, president of Republic Steel Corp., third largest steel producer, told the President that Republic Steel would ignore the price freeze request. He criticized the President for expecting the steel companies to substitute the "personal judgment" of the economic advisors "for the known efficiency and fairness of the competitive marketplace. This we cannot do."

But as the others, Mr. Patton failed to commit Republic Steel to a particular course of price action. "We frankly do not know whether, or to what extent, or when, Republic Steel may adjust its prices, because we cannot predict or control the vigorous competition which requires us to adapt to prevailing market conditions," Mr. Patton said.

Although the steelmakers counterattacked sharply, they failed to remove themselves from the hot-spot on which President Kennedy placed them. To raise prices, will put the steel industry in the position of defying the President's request, which was couched in terms of national interest. Not to raise prices after October's scheduled pay boost—the second since last year—could squeeze an already thin profit-to-sales margin.

The most the industry may do is institute selective increases, a possibility that became apparent well before the receipt of President Kennedy's letter on prices.

Equipment Orders Turn Down



New orders for construction equipment dipped in July for the second consecutive month, following the same seasonal pattern as in 1959 and 1960. Despite the decline, however, July orders from equipment distributors topped the year-ago order volume for the twelfth month in a row. The year-to-year margin expanded slightly between June and July—from 8% to 9%—but it failed to match the spreads evident in earlier months.

For the first seven months of this year the new orders index averages 160, up 11% over last year. July value fell to 154 from June's revised value of 160. The McGraw-Hill Economics Department compiles the index from reports by cooperating manufacturers. The index values are based on average monthly dollar volume of new orders from distributors in 1950 as 100.

ENR's Contract Award Index showed greater steadiness than usual during this year's spring and summer. The trend took more of a plateau shape instead of the usual sharp runup from spring to a midsummer peak. During the five months of April through August, the Contract Award Index ranged from 177 to 196, based on 1950 as 100. Last year's corresponding high-low range was much greater—176 to 225—while 1959's range was 146 to 193.

In August, the Contract Award Index fell to 173, bringing the eight-month average to 167. This represents a 2% dip from the same period in 1960. But the index is expected to climb in the next four months to an average of about 188, which would pull the full year's index reading slightly above the record 172 set in 1960.

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Further savings are assured through the Wedgelock coupling. You get fastest possible connections. Lines can be made up with only one side of the pipe exposed. No special equipment is necessary—a hammer is the only tool required.

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NAYLOR PIPE *Company*

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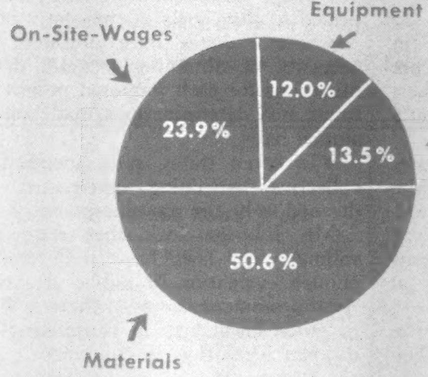
CIRCLE 262 ON READER SERVICE CARD

Highway Construction Costs

Where each $1,000 goes*



* U. S. Labor Department figures based on construction contract expenditures for federal-aid highways in 1958.

Distribution of On-Site Work

(for each $1,000 of highway construction)

	Man-hours	Percent
All occupations	94	100
Equipment operators:		
Operators of tractors, loaders, bulldozers, scrapers, etc.	18	19.1
Truckdrivers	11	11.8
Operators of cranes, hoists, draglines, shovels	4	4.0
All other equipment operators	3	2.9
Crafts associated with equipment	4	5.4
Other skilled crafts	13	13.7
Unskilled	31	32.5
Professional, managerial, clerical and service	10	10.6

Wages Are One-Fourth of Highway Costs

Highway construction generates about as much employment as school construction does but its effects are less diversified, according to the U. S. Labor Department's Bureau of Labor Statistics.

In the second of a series of studies on labor requirements for various types of construction, the Bureau estimates that each $1,000 of highway construction requires 219 man-hours of employment—94 hours at the construction site and 125 hours elsewhere.

Corresponding figures on the labor requirements for the same dollar volume of school construction, as estimated by the Bureau, are 84 man-hours at the site and 128 off the site, or a total of 212 hours. (See p. 108 for details of the BLS report on how school costs break down.)

Most of the on-site highway employment data used by the Bureau is based on 1958 figures and comes from studies made by the Bureau of Public Roads.

BLS estimates that during the period 1958-60, highway construction required annually about 300,000 full-time jobs at the construction site and an additional 350,000 jobs in producing and transporting the materials, supplies and equipment that were used.

The bulk (nearly two-thirds) of the highway construction dollar goes into materials and equipment, according to the Bureau. Wages of on-site workers account for slightly less than a fourth of the contract cost. At least that was the situation in 1958 (see chart).

The amount of the construction dollar consumed by on-site labor costs, however, appears to be declining. During the period 1947-58, BLS notes, on-site labor requirements for highways dropped 47%. The Bureau attributes the decline largely to the increasing use and efficiency of roadbuilding equipment used in earth moving, paving and finishing.

Part of the decrease in on-site manhours, BLS says, may also be due to changes in road design and composition.

A handful of trades get a lion's share of the on-site highway work because of the widespread use of construction equipment.

Over 43% of the on-site labor, according to BLS, consists of equipment operators and those in related occupations, such as oilers, mechanics, firemen and stationary engineers. All other skilled crafts combined (including structural iron workers, carpenters and concrete finishers) represent only a seventh of the total hours worked. The balance of the laborers' and mechanics' work goes to unskilled workers, who get about one-third of the on-site work. Professional, managerial, clerical and service workers account for about 10 percent of the total on-site hours (see table).

The manufacturing sector is the area of the economy (other than construction) that is most affected by highway construction, according to the Bureau.

Basing its conclusions on 1958 figures, BLS says that each $1,000 of construction requires 60 hours of employment in manufacturing, half of which occurs in the last manufacturing stages before shipment to the construction site.

The principal industries directly affected are producers of fabricated metal products, construction machinery, cement and concrete products. Manufacturing industries less directly but substantially affected include the iron and steel industries that furnish steel to the metal fabricating industries, and the iron and steel forgings industry, which furnishes parts to the equipment manufacturers and other fabricators.

Among the industries that share in the balance of the 125 man-hours of off-site work required for each $1,000 of construction are: Mining, 23 hours; trade and service, 13 hours; transportation, 15 hours.

Speaking in terms of costs, BLS says that about 12% of the contract dollar goes into construction equipment, 18% into aggregates, 12% into steel (excluding that used in equipment) and 10% into petroleum products.

In general, the manufacturing industries get less out of the highway dollar than they do out of the school dollar, BLS concludes.

The Bureau is conducting similar studies on hospitals and public buildings. Subsequent studies are expected to cover public housing, sewer and water projects.

Prevailing Wages Have No Norm

State 'Davis-Bacon' laws covering wages on public works vary widely in coverage and application

Prevailing wage laws at the state level represent a hodgepodge of minimum wage legislation. They follow no uniform standards. And there is no authoritative information on their economic effects or on the experience various states have had with some of the laws' more unusual provisions.

Those are the general conclusions of University of Wisconsin Professor David B. Johnson in a study published this month by the U. S. Labor Department.

Mr. Johnson reports that most public construction work is now subject to some kind of prevailing wage law. As of the first of this year, 32 states had such legislation on the statute books. Pennsylvania has enacted a prevailing wage law since then.

The state laws follow the pattern of the federal Davis-Bacon Act only in a broad sense, according to Mr. Johnson.

Under that law, workers employed under government contracts in excess of $2,000 for "construction, alteration, and/or repair, including painting and decorating, of public buildings or public works" must be paid not less than prevailing rates. Prevailing rates are defined in the federal law as those "prevailing for the corresponding classes of laborers and mechanics employed on projects of a character similar to the contract work in the city, town, village, or other civil subdivision."

The various state laws, however, achieve the general objectives of the federal law in different ways. Some fall far short of the mark, while others exceed it. Mr. Johnson points out, for example, that:

- Twelve states have laws with essentially the same coverage as the federal law. Some, in addition, specifically include demolition or maintenance work. Coverage of the laws of eight states is indefinite. The Maryland law applies only to highway work in three counties. Some state laws do not cover highway work.
- Only a few states follow the federal law's $2,000 minimum for coverage. The minimum ranges from $300 to $5,000 in eight states. Some states have no explicit dollar minimums.
- Although most state laws apply to contracts made by political subdivisions as well as the state, the laws of five states cover state contracts only.
- The state laws vary widely in what is meant by "prevailing wages." Many have no specific standards. Some do not attempt to define the "locality" in which they "prevail." Some laws use the county as the "locality" and others use the city or town in which the public work is located.
- Most states take hourly wage rates only into account. Five states require employer payments to health and welfare, pension and vacation funds. Seven other states require, in addition, payment of overtime and holiday pay at prevailing rates.
- Some states have given the power to determine prevailing wages to their state labor agencies. Others have given it to the contracting agency or to a special panel. Two states use the federal determinations. The laws of three states have no readily apparent agency for determining rates.
- Wage determinations may be appealed to the courts in two states only.
- Several states have obviated the necessity of obtaining separate determinations for each proposed project by using area determinations made on an annual basis.
- In seven states, rates specified in collective bargaining agreements are deemed to be the prevailing rates.

Mr. Johnson feels that state prevailing wage laws have not received enough evaluation or public attention. At the moment, he says, there is little to guide lawmakers in considering additional legislation in this area.

Board Speeds Dispute Handling

The construction industry's National Joint Board for the Settlement of Jurisdictional Disputes has streamlined its procedures to expedite the handling of jurisdictional disputes involving construction unions on missile site installations.

It now requires an average of 10 days to render a job decision in a conventional jurisdictional dispute even though the Board is operating on a current basis without a backlog of jurisdictional dispute cases. The Board hopes its new procedure will enable it to cut this time to six or seven days in missile site disputes.

Board Chairman R. J. Mitchell said last week that one of the procedural changes applicable to missile disputes is the use of wire instead of mail in getting positions and information on disputes. Another is giving priority to missile base disputes on the agenda of the weekly meetings of the Board.

The Joint Board is made up of eight labor members representing the AFL-CIO Building and Construction Trades Department, and eight industry members. Four of the industry members represent the Associated General Contractors. Four represent specialty and mechanical contractors' associations.

The Board procedure is voluntary machinery for the peaceful settlement of jurisdictional disputes. Under that procedure, disputing unions must remain on the job and the disputed work must continue pending a job decision.

Labor in Brief . . .

- **Strike legislation**—Disturbed by a recent 46-day strike of operating engineers, Gov. Mark O. Hatfield of Oregon has appointed a seven-member commission of union and management representatives to prepare new state legislation aimed at coping with strikes and lockouts after collective bargaining breaks down.

- **Settlement** – Plumbers in Butte, Mont., have returned to work with a new two-year, 34.5-cent labor contract after a 20-day stoppage. The increase is payable in three installments—12, 10 and 12.5 cents. New scale is $3.77, plus 15 cents in fringes.

- **Automation**—A new word in collective bargaining—TAP—was coined last week when Armour & Co. concluded a new three-year labor pact covering 15,000 workers in the meatpacking industry. The contract gives TAP (Technological Adjustment Pay) of up to $65 a week for 26 to 39 weeks to workers who lose their jobs through plant closings.

- **Insurance rates up**—Workmen's compensation insurance rates have been raised in Kansas to reflect liberalized benefits passed by the 1961 legislature. Increases average 7% for all industrial and about 8% for construction.

OFFICIAL PROPOSALS

RATE: The rate for Official Proposal advertising is $2.70 per line or fraction set solid. Where the advertisement is set other than solid, the space is measured by total space occupied and charged on basis of 12 lines to the inch.

CLOSING DATE: Friday 10:30 A.M. for issue dated the following Thursday.
SEND COPY TO: Official Proposal Division,
Engineering News-Record
Class. Adv. Div.,
P. O. Box 12, N. Y. 36, N. Y.

Bids: October 5, 1961

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Canal Law, Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid Funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 5th day of October 1961, by Henry A. Cohen, Director, Bureau of Contracts, 12th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1, F. J. Fuller, District Engineer, 353 Broadway, Albany 1, New York						
Albany (Int. Trg. Rte. 87)	FIM 61-5	Interstate Route 502 (FISH 57-17, Albany to Latham) (Bridges over Central Ave.) Project I-87-3(48)	0.04	Experimental Glass Fiber Reinforced Resin Wearing Surface on Bridge Pavement	$3,500 Plans $5	$63,300
Saratoga (Rte. 67)	FARC 61-139	Ballston Spa-Scotch Church, Pt. 2, S.H. 5542 Project S-382(4)	4.29	Asphalt Concrete	$35,000 Plans $5	641,000
Saratoga (Rte. 67)	FARC 61-81	Scotch Church-Blue Corners, S.H. 817 Project S-382(3)	3.47	Asphalt Concrete 3.46 Mi.; Misc. Work 0.01 Mi.	$34,000 Plans $5	577,000
Saratoga (Rte. 197)	FASSH 61-19 FARC 61-141	Moreau-Reynolds Corners Reynolds Corners-Fort Edward, S.H. 1748 Project S-401(2)	3.61	Asphalt Concrete 3.60 Mi. Misc. Work 0.01 Mi.	$32,000 Plans $5	573,000
Warren (Rtes. 8 & 9)	RC 61-138	Riverside-Chestertown, S.H. 691 Loon Lake-Pottersville-Taylors, S.H. 692	6.66	Asphalt Concrete	$22,000 Plans $5	365,000
Washington	M 61-13	Canal Bridges in the Towns of Fort Ann & Fort Edward	....	Painting Undersides of 6 Canal Bridges	$260 No Plans $5 for 2 Proposals	5,000
DISTRICT No. 2, L. Ketchum, District Engineer, 109 No. Genesee Street, Utica 1, New York						
Montgomery	M 61-12	Dam 6, Lock 10E West of Pattersonville	....	Rehabilitation of Protecting Apron	$11,000 Plans $5	215,000
Oneida	M 61-11	Schuyler St. Bridge (E-45) Over Erie Canal 1½ Miles West of Utica	....	Removal of Steel Superstructure	$220 Plans $5	4,000
DISTRICT No. 3, E. E. Towlson, District Engineer, 333 E. Washington Street, Syracuse, New York						
Onondaga (Rtes. 80, 91)	FARC 61-140	Vesper-Tully, S.H. 1070; Tully-Apulia, S.H. 489; Tully-Onondaga Castle, Pt. 2, S.H. 489; LaFayette-Tully, S.H. 5516; Fabius-Apulia, Pt. 3, S.H. 121; Fabius-Apulia, Pt. 1, S.H. 49; Fabius-Apulia, Pt. 2, S.H. 75; Fabius Road, S.H. 554; Fabius Village, S.H. 1043 Project F-549(3)	9.48	Asphalt Concrete Type 1A	$40,000 Plans $5	730,000
Oswego (Rte. 104A)	FARC 61-142	Sterling-Oswego, Pt. 2, S.H. 1046 Project F-535(3)	2.66	Asphalt Concrete Type 1A; Twin Closed Box Culvert 39.06′	$27,000 Plans $5	497,000
Seneca	FASSH 61-16	Magee-Halsey Corners (Old State Road) Project S-591(1)	4.16	9″ Cement Concrete Pavt. 24′ Wide	$57,000 Plans $5	1,027,000
Tompkins (Rte. 13)	FAC 61-18 FASH 61-18	City of Ithaca: North East Arterial Highway (Rosemary Lane-East City Line) Ithaca-Etna Project U-F-1144(2)	6.70 (2.38 Acc.)	9″ Cem. Conc. Pavt., 2 @ 24′, 3.34 Mi.; 9″ Cem. Con. Pavt., 24′, 3.35 Mi.; Acc. Cem. Conc. Pavt., 1.13 Mi.; Acc. Asph. Conc. 1.25 Mi.; Misc. Work 0.01 Mi.; 3 HGS 240′, 226′, 199′; 1 Br. 137′—All Comp.	$235,000 Plans $10	4,272,000
DISTRICT No. 4, B. F. Perry, District Engineer, Barge Canal Terminal, Rochester 1, New York						
Livingston (Rte. 5)	RC 61-151	Caledonia-Avon, S.H. 5273 Avon-Lima, S.H. 5302	0.06	Bridge Repairs	$3,000 Plans $5	55,000
Monroe (Int. Trg. Rte. 490)	FITL 61-1	Interstate Route Connection 580; Rochester-Bushnell Basin, Pts. 1 & 2; FASH 54-1, FISH 56-9 Project I-490-2(10)	6.53	Electrical Lighting Facilities	$12,000 Plans $5	225,000
Monroe (Rte. 251 & 383)	FARC 61-146	Scottsville-Mumford, S.H. 5046 Scottsville-Chili, S.H. 5279 Project S-517(1)	6.49 (0.78 Acc.)	Asph. Concrete 7.27 Mi.; Repairing & Painting Bridge, Repairing Culverts	$45,000 Plans $5	814,000
Wyoming (Rte. 78)	FARC 61-143	Java Center-Java Village, S.H. 894; Java Village-Wales, S.H. 976A; Java Village-Wales, S.H. 976 Project F-1158(1)	3.63 (0.09 Acc.)	Asph. Conc. 3.56 Mi.; Misc. Work 0.16 Mi.; Repairs to Br. #1	$45,000 Plans $5	807,000
DISTRICT No. 5, E. G. H. Youngmann, District Engineer, State Office Bldg., 65 Court St., Buffalo 2, New York						
Erie	FASS 61-10 FISS 61-11	Maple Rd. Extension (CR 192) & the Separation of Grades of Maple Road Extension (CR 192) with Powerline Expressway & Lehigh Valley R.R. Project S-250(3)	1.74	Asph. Conc. 1.74 Mi.; HGS Comp. I Beam, 4 Sps. 251′; RRGS Comp. I Beam, 3 Sps. 178′; 2 Reinf. Conc. Twin Box Culverts	$95,000 Plans $5	1,725,000
DISTRICT No. 6, W. J. Dennis, District Engineer, State Office Bldg., 30 West Main St., Hornell, New York						
Allegany (Rte. 17)	FARC 61-144	Genesee-Portville, S.H. 1322 Project F-421(9)	5.36	9″ Cement Conc. Pavt. 24′ Wide	$84,000 Plans $5	1,526,000
Allegany (Rte. 408, 305)	FATC 61-4	Cuba-Friendship, S.H. 5174; Obi-Cuba, S.H. 965 Project F-294(3)	....	Traffic Signal	$1,200 Plans $5	21,000
Yates (Rte. 14A)	FARC 61-145	Penn Yan-Halls Corners, S.H. 5323 Project F-146(4)	3.12	Asph. Conc. 3.08 Mi.; Misc. Work 0.04 Mi.	$15,000 Plans $5	279,000
DISTRICT No. 8, M. N. Sinacori, District Engineer, Pleasant Valley Road, Poughkeepsie, New York						
Rockland	PIP 61-1	Palisades Int. Pkwy., Sec. 2 Palisades Int. Pkwy., Part 1	15.36	Aluminum Chain Link Fencing, 4′ & 5′ High	$8,000 Plans $5	152,000
Westchester (Int. Trg. Rte. 95)	FINET 61-2	Interstate Rte. 501 N. Y. State Thruway, New England Section (Subdivisions 2, 3, 4, and 5) Project I-95-2(11)	9.94	Roadway, Guide Rail and Drainage Improvement	$3,700 Plans $5	68,000
DISTRICT No. 9, J. C. Federick, District Engineer, 71 Frederick St., Binghamton, New York						
Broome (Rte. 17)	FATS 61-22	Windsor-Deposit, S.H. 5338 Project F-344(29)	9.34 (3.09 Acc.)	Traffic Signs and Delineators	$2,000 Plans $5	34,000
DISTRICT No. 10, A. M. Sarr, District Engineer, 325 W. Main Street, Babylon, L. I., New York						
Bronx (Int. Trg. Rte. 95)	FINETC 61-1	Int. Rte. Connection 511 N. Y. State Thruway, New England Section (Westchester Ave. to N. Y. C. Line) Cont. 6 Project I-95-1(45)	3.54	Misc. (Grading, Asph. Pavt., Stone Masonry, Curbs, Drainage, Bridge Repairs	$2,000 Plans $5	36,000

(Continued on the following page)

OFFICIAL PROPOSALS

(Continued from preceding page)

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
Nassau	PSC 10324	Elim. of Grade Xings of the L. I. R. R. with Various Streets in Hicksville (Main Line-Port Jefferson Division)	3.32 (0.53 Acc.)	Track Reloc., RR Sta. and Misc. 3.32 Mi.; Cem. Conc. Pavt. 0.16 Mi.; Asph. Conc. 0.37 Mi.; 8 R.R. Gr. Seps. Pl. Girder; 1 Viaduct Reinf. Conc., I-Beam and Girder	$563,000 Plans $10	10,243,000
New York (Int. Trg. Rte. 478)	FILME 61-2	Int. Rte. Conn. 513 Lower Man. Expwy., Contract 2A (Canal St. to Manhattan Bridge) Project I-478-1(66)	0.15	East Ramp Man. Bridge, Cem. Conc. Pavt. 0.09 Mi.; Asph. Conc. 0.02 Mi.; Misc. Work 0.04 Mi.	$62,000 Plans $5	1,058,000
Queens (Int. Trg. Rte. 495)	FAVWE 61-3 FIHHE 61-1	Van Wyck Expwy. Extension, Contract 2 (57th Rd. to Rodman St.) Int. Rte. Conn. 514 Horace Harding Expwy. (Gr. Cent. Pkwy. Interchange to Van Wyck Expwy. Interchange) Project U-1085(21), I-495-1(49)	0.88 (2.77 Acc.)	8" & 9" Cem. Conc. Pavt. 2 @ 48′ Var.= 2.55 Mi. Asph. Conc.= 1.02 Mi.; Misc. Work = 0.04 Mi.; Main Line Viad. 40 Sps. Comp., I-Beam 3029′; 4 Ramps 77 Sps. Comp. I-Beam 5822′; 1 Ramp Reinf. Conc. Slab 22 Sps. 440′, Reinf. Conc. Box Sewer 365′	$670,000 Plans $10	12,222,000
Queens (Int. Trg. Rte. 678)	FIWE 61-1	Int. Rte. Conn. 515 Whitestone Expwy., Cont. 1 (Flushing River Bridge to Whitestone Bridge) Project EI-678-1(64)	1.95 (2.66 Acc.)	Asph. Conc. 4.19 Mi. 9" Cem. Conc. Pavt. 0.12 Mi.; Misc. Work 0.30 Mi. HGS. Conc. Arch 2 Sps. 146′ HGS. Comp I-Beam 2 Sps. 158′; HGS. Comp I-Beam and Prestressed Conc. 1323′	$530,000 Plans $10	9,676,000
Queens	FAGCP 61-3	Grand Central Pky., Sect. 3, Contract 2 (150th St. to 172nd St.) Project U-629(20)	0.91 (1.62 Acc.)	8" Cem. Conc. Pavt. 0.87 Mi. Asph. Conc. 1.54 Mi.; Misc. Work 0.12 Mi.; 3 HGS. Welded Comp. Beam 101′, 100′, 100′	$425,000 Plans $5	7,781,000
Queens	FAGCP 61-4	Grand Central Pky., Sect. 3, Cont. 3A, (172nd St. to Clearview Expy.) Proj. U-629(21)	2.14 (2.07 Acc.)	8" Cem. Conc. Pavt. 3.08 Mi. Asph. Conc. 0.90 Mi.; Misc. Work 0.23 Mi.; Widen 2 HGS. Conc. Rig Fr. 1 @ 63.5′ Sp.; 1 @ 108.75′ Sp.; 2 HGS. Comp I-Beam; 2 Sp. 163′ Tot.; 4 Sp. 188.3′ Tot.	$270,000 Plans $10	4,917,000
Suffolk	HSP 61-1	Heckscher State Pkwy. Cont. 6 (Sunrise Highway to Heckscher State Park)	6.23	Roadside Improvement	$18,000 Plans $5	318,000

Any projects in this letting that are on the Federal Aid highway systems are subject to the provisions of the "Federal Aid Highway Act. of 1956", being Public Law 627, 84th Congress, approved June 29, 1956, and are also subject to the applicable New York State statutes.

In compliance with the provisions of Section 115 (Prevailing Rate of Wage), Public Law 627, the minimum wages to be paid laborers and mechanics are included in wage schedules that are set out in the bid proposal.

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

If the deposit is $10.00 or more, full refund for one copy of the plans and specifications will be made to a bidder for the particular project, if such plans and specifications are returned in good condition within 30 days after the award of the contract or after the rejection of the proposal. The successful bidder is not required to return the copy of the plans and specifications in order to be entitled to such refund. If the deposit is $10.00 or more, partial refund will be made for the return of all other copies of plans and specifications in good condition within 30 days after the award of the contract or the rejection of the proposal.

Special attention of bidders is called to "Information for Bidders" in the Public Works Specifications, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to priorities and allocations under the Defense Production Act of 1950, as Amended, and all regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Department of Public Works" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bid deposit, the execution of the contract and bond shall conform to the provisions of the Highway Law, as set forth in the "Information for Bidders".

The right is reserved to reject any or all bids.

J. BURCH McMORRAN
SUPT. OF PUBLIC WORKS

Bids: October 17, 1961

Kingdom of Thailand
Royal Irrigation Department
Bangkok, Thailand

INVITATION FOR BIDS—NO. YS-4-6 METAL TUBING AND FITTINGS FOR CONCRETE COOLING AND GROUTING SYSTEMS

The Royal Irrigation Department of the Kingdom of Thailand hereby invites sealed written bids for furnishing and delivery either fob Contractor's shipping point or cif Bangkok Wharf, Kingdom of Thailand for the Yanhee Multipurpose Project in accordance with the Contract Documents, Invitation for Bids No. YS-4-6, the following materials:

Approximately 386,000 kilograms (aluminum) or 948,000 kilograms (steel) of metal tubing and fittings for concrete cooling and grouting systems.

Bids will be opened at 10:00 A.M., 17 October 1961. Copies of Contract Documents, Invitation for Bids YS-4-6 may be obtained by qualified Bidders on written request on Bidder's letterhead, addressed to:

Royal Irrigation Department
Attention: Thai Liaison Engineer
c/o Engineering Consultants, Inc.
1901 South Navajo Street
Denver 23, Colorado

Each request must be accompanied by a check or money order made payable to the Royal Irrigation Department in the amount of U. S. $5.00 for each copy of the Contract Documents requested. The remittance is non-returnable.

M. L. Xujati Kambhu
Director General
Royal Irrigation Department
Kingdom of Thailand
Bangkok, Thailand

September 7, 1961

Bids: See Advertisement

The Port of New York Authority

Sealed proposals for the following work will be received at the Office of the Chief Engineer, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 P.M. on date indicated, at which time said proposals will be opened and read in Room 1108.

Contract GWB-190.029—George Washington Bridge—Lower Level Expansion—New Jersey Approach—Phase 6—Deposit $50.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, October 19, 1961.

Contract EP-110.020—Elizabeth-Port Authority Piers—Fire Pumping Station and Water Storage Tanks—Deposit $30.00 per set of documents—Bids will be received until 2:30 P.M. on Thursday, October 19, 1961.

Contract EP-110.022—Elizabeth-Port Authority Piers—Terminal Street Extension —Phase II—Surcharge Fill—No deposit required—Bids will be received until 2:30 P.M. on Thursday, September 28, 1961.

Contract documents may be seen at the Office of the Assistant Chief Engineer for Design, Room 1115, 111 Eighth Avenue, New York 11, N. Y. Documents will be furnished upon receipt of the above deposit (each set including one copy of the Contract Drawings) for not more than three sets to any one company. Additional sets will be furnished upon payment of an amount for each set equal to the deposit indicated above, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 1001, where a receipt will be issued. The receipt shall be delivered to Room 1115, where the documents will be furnished.

Those who have submitte a bid on the contract directly to the Authority will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of documents, not exceeding three returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
S. Sloan Colt, Chairman
New York, September 21, 1961.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5666) will be received at [illegible]ok, Nebraska, until 10 a.m., Central Standard Time, October 26, 1961, for furnishing labor and materials for Earthwork and Structures, Red Willow Canal, Station 8+00 to Station 476+50 and Laterals and Drains, Missouri River Basin Project, Nebraska. Location near Indianola, Nebraska, in Red Willow County. Principal items are Excavation 570,000 cu. yds.; Earth Lining 35,500 cu. yds.; Concrete in structures 1,600 cu. yds.; and other work. Completion time 500 days. For particulars, address Bureau of Reclamation, Building 46, Denver Federal Center, Denver 25, Colorado; Post Office Box 737, McCook, Nebraska; or Building 53, Denver Federal Center, Denver 25, Colorado. Floyd E. Dominy, Commissioner.

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OFFICIAL PROPOSALS

District of Columbia—Screens Chamber—Dept. of Sanitary Engineering, D. C., Sept. 11, 1961. CONSTRUCTION OF THE OXON RUN SCREENS CHAMBER AT THE DISTRICT OF COLUMBIA SEWAGE TREATMENT PLANT (Invitation No. C-626-S) consisting of furnishing all labor, equipment and materials and performing all work for construction of the Oxon Run Screens Chamber. (Wage rates have been predetermined by Labor Dept.) Bid forms, plans and specifications are now available from Supervisor, Bid & Contract Division, Procurement Office, D. C., Room 404, 499 Penn. Ave., N.W., upon deposit of a certified check for $50.00 per set, payable to D. C. Treasurer. (Phone NA 8-6000, Ext. 448). SEALED BIDS to be opened 3:00 PM, EDT, October 3, 1961, in Room 424, 499 Penn. Ave., N.W.

U. S. Government

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-5667) will be received at Placerville, California, until 9 am. Pacific Standard Time (10 am. Pacific Daylight Savings Time), October 19, 1961, for furnishing labor and materials for Earthwork, Pipeline Structures and Reservoirs, Diamond Springs Main, Feeder Line and Laterals 1.8N, 3.3N, 3.6N, 5.9N, and 6.9N, El Dorado Distribution System, Central Valley Project, California. Location near Placerville, California, in El Dorado County. Principal items are 192,000 cu. yds. excavation; 18 miles furnishing and laying pipe; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, P. O. Box 2511, Sacramento, California; P. O. Box 707, Placerville, California; or Building 53, Denver Federal Center, Denver, 25, Colorado. Floyd E. Dominy, Commissioner.

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OFFICIAL PROPOSALS

Bids: October 10 & 17, 1961*

New York City Housing Authority

ADVERTISEMENT FOR BIDS
GAYLORD WHITE HOUSES
MOTT HAVEN HOUSES

Sealed proposals will be received by the New York City Housing Authority, 299 Broadway, New York 7, N. Y., until the times indicated below, at which times said proposals will be opened and read in Room 312, for:

1. Foundations and General Construction
2. Heating and Ventilating
3. Electric Work
4. Plumbing
5. Elevators

For the following two housing developments:

1. Mott Haven Houses (Project No. NY 5-44): Located in the area bounded generally by East 144th Street, Willis Avenue, East 140th Street, Alexander Avenue, and Third Avenue, excluding certain areas in the northwest portion and the southwest portion, in the Borough of the Bronx, New York City. Consisting of one 22-story and seven 20-story buildings with 4-story wings and one 2-story community-center building; of reinforced-concrete construction; containing 993 apartments. Bids will be received until 2:30 P.M., October 17, 1961.*
2. Gaylord White Houses (Project No. NYS-95): Located in the southeast portion of the area bounded generally by East 105th Street, Second Avenue, East 104th Street, and Third Avenue, in the Borough of Manhattan, New York City. Consisting of one 20-story building with 1- and 3-story wings, and 9- and 12-story setbacks; of reinforced-concrete construction; containing 248 apartments. Bids will be received until 2:30 P.M., October 10, 1961.*

A more complete description of the work and full information for bidders is contained in the Contract Documents. A deposit of $75 is required for documents for Nos. 1-4 for each project; reimbursement of $74 will be made upon their safe return. A deposit of $25 is required for documents for No. 5 for each project; reimbursement of $24 will be made for their safe return. Deposit may be made by cash or check payable to the Authority, at the cashier's office, 12th floor, 299 Broadway, and the documents obtained at 297A Broadway upon presentation of the cashier's receipt.

If a proposal is duly submitted by any person or corporation making the deposit required, the full amount of such deposit for one set will be returned to such person or corporation, provided that the set is returned in good condition within thirty (30) days following the award of the contract or the rejection of the proposal of such person or corporation. Upon return of any other sets in good condition within such period whether by a person or corporation duly submitting a proposal or by some other person or corporation, reimbursement will be made to the extent specified for each such set returned.

The Authority reserves the right to waive any informalities in the bids received, to reject any or all bids, and to award the contract only to those who, in accordance with the regulations and judgment of the Authority, are fully experienced in this type of work and have an adequate financial status. No prequalification is required for the above contracts.

NEW YORK CITY HOUSING AUTHORITY
William Reid, Chairman

*The Authority reserves the right to postpone the bid date.

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SEPTEMBER 25TH**

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Discount of 10% if full payment is made in advance for 4 consecutive insertions.

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• *POSITIONS VACANT*

Structural Engineer-Midwest consulting firm seeks Ph.D. to design complex steel structures, reinforced and prestressed concrete. Preference will be given to applicants with practical experience. Permanent position with established firm in business since 1929. Moving expenses paid. Send resume, including education, experience, and personal qualifications to P-6245. Engineering News-Record.

Engineers experienced in design of water and sewage projects. Location, Ohio. Send complete resume and salary requirement. P-7218, Engineering News-Record.

City of Arcata has openings for: City Engineer, Calif. Regis. C.E., exper. including muni. pub. wks, water and sewer systems, $600-$750, starting salary dependent upon experience. Asst. City Engineer, Grad. Engr., E.I.T., office and field work, pub. wks. exper. preferred, $500-$600. Live and work in the heart of the Redwood Empire College town, modern schools, equable climate. Apply City Mgr., City Hall, Arcata, Calif.

Water Supply Designers (3) Reg. P.E.'s high salary, subsistence, bonus and other fringe benefits. Overseas assignment 18 months. Send Resume: Brown Engineers, 10 Columbus Circle, New York 19, N. Y.

Estimator—experienced in all types of excavation, and concrete structures. Expanding company, location in East. Please send resume. P-7396, Engineering News-Record.

Water Plant Superintendent—Water Distribution Superintendent—Mid-Western University City of 40,000 population is accepting applications of the above positions. The City has recently assumed operation of the Water Utilities and the position offers a real challenge for competent and experienced men. Salary open, liberal vacation, sick leave, etc. Apply P-7440, Engineering News-Record.

Positions open for experienced highway designers, draftsmen and tracers. Address application to Yule, Sticklen, Jordan & McNee, P.O. Box 337, Camp Hill, Pa.

Engineering Sales Correspondent—The Fabricated Products Division of a major steel corporation is looking for a young engineering graduate to fill the position of sales correspondent in its Philadelphia branch office. This position will lead to a sales engineer field assignment in one of the Mid-Atlantic States. Attractive base salary, bonus plan and fringe benefits. P-7438, Engineering News-Record.

Overseas Managers. Long established U. S. consulting engineering firm is seeking engineering graduates to assume positions as overseas Branch Managers. Positions require administrative and management skills, together with experience in design and construction work. Age should be in range of 35 to 50 years. Excellent opportunity for qualified individuals to grow with expanding overseas operation. Send resumes covering personal background to P-7380, Engineering News-Record.

Sanitary Engineer. Opportunity to assume overall supervision and client contact on sanitary projects for long-established midwestern consulting engineering firm. Experience in all phases of sanitary work is desired. Send complete resume of experience and qualifications. Replies held in strictest confidence. Our employees know of this advertisement. P-7178, Engineering News-Record.

(Continued on the following page)

MAINTENANCE ENGINEERS
FOR
OVERSEAS PROJECTS

Extensive maintenance programs for the U. S. Government in the Orient requires experienced personnel with proven competence for the following positions:

Project Engineers **Electrical Linemen**
Civil Engineers **Power Plant Operators**
Planning Engineers **Utilities Supervisors**
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Electrical Design Engineers

Applicants must be under 50, in excellent physical condition and possess a college degree or valid license. Qualified applicants will receive immediate reply.

Airmail complete detailed experience record and personal data to—

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TRANS-ASIA/HOOD, A Joint Venture
CPO BOX 1412
TOKYO, JAPAN

CIVIL ENGINEERS

Graduate Civil Engineer with at least 10 years progressive experience in design of powerhouses, tunnels, and intake structures for Section Head position. Working knowledge of fill dams and hydraulics with capability for following design studies in other departments required. Must have initiative to carry out studies to completion. Experience in client contact also necessary.

Graduate Civil Engineer as cost estimator for large hydro project with good experience in writing and reviewing specifications. Must have at least 5 years experience.

Fringe benefits and partial relocation costs. Send complete resume to Personnel Manager.

HARZA ENGINEERING COMPANY
400 West Madison Street, Chicago 6, Illinois

GRADUATE CIVIL or ARCHITECTURAL ENGINEERS and SENIOR CARPENTER FOREMEN

We are looking for young, recent college graduates, with a degree in either architectural or civil engineering, for a position in our El Paso, Texas Estimating Department. This position provides a training ground for our future superintendents and executives. It is an excellent opportunity for a young man to obtain a desirable position with a reliable firm doing all types of construction work.

Experienced senior carpenter foremen required for work in Southwest area.

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General Contractor, Inc.
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Exceptional opportunity for experienced Building Construction man with previous experience preferably as General Superintendent with large general contractors or as Superintendent with responsible charge of large, complex, competitively bid projects. Must have record of accomplishment with thorough background in all phases of large building construction jobs, competent and coordinating. Expanding nation-wide operations of this company require travel by General Superintendent to oversee projects with individual jobs ranging up to $20 million. Total active contract of company approximately $75 million.

Applications will be held in the strictest confidence. Direct replies to:

P-7448, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

SOILS ENGINEER

Civil engineers trained or experienced in soils mechanics and geologists will receive preference for this permanent position with Midwest technical laboratory engaged in consulting work. Moving expenses paid. Some travel. Send complete resume to

P-7499, Engineering News-Record
645 N. Michigan Ave., Chicago 11, Ill.

• *POSITIONS VACANT*

(Continued from preceding page)

Permanent openings for Resident Engineers experienced in supervision of construction of large steam power plants and/or high-voltage transmission lines. Degree and registration desirable. Excellent opportunity with consulting engineering firm. Please send resume of education and experience to P-7228, Engineering News-Record.

Openings for recent Civil Engineer graduates with military obligations completed who desire to learn the construction business. Must be ambitious, aggressive, dependable, use no intoxicants, willing to start in the field on industrial buildings, defense construction, heavy construction, and willing to move. Preferably single. We operate throughout Kansas and adjacent states; offer excellent opportunity for advancement. Martin K. Eby Construction Co., Inc., P. O. Box 1679, Wichita, Kansas.

Superintendent Experienced in gas and telephone line construction—Eastern location. P-7196, Engineering News-Record.

Highway Consulting—Saudi Arabia; Admin., testing, locating, designing, constr. supervision. 2 yr. engagement, immed. assignment. Send qual. H. W. Lochner, Inc., 20 North Wacker Drive, Chicago.

Highway Construction Supervision — Hartford, Conn. Exp. req., send qual. H. W. Lochner, Inc., 20 North Wacker Dr., Chicago.

Maintenance Superintendent needed by large and old Southern gravel producing corporation operating in Tenn, Ark, and Miss. Permanent position for mature man experienced in heavy equipment, cost records, preventative maintenance programs. Fringe benefits. Send complete resume with recent picture and starting salary required to P-7490, Engineering News-Record.

Highway Designer—Requires five years experience in state or interstate highways including interchanges. Submit complete education and experience resume and salary expected. Green Engineering Company, 504 Beaver Street, Sewickley, Pennsylvania.

Engineer, civil, to take charge of estimating for well-established NYC and LI building contractor. Must have management potential. P-7487, Engineering News-Record.

Engineer, civil, to be sales representative for NYC and LI building contractor. Must have management potential. P-7486, Engineering News-Record.

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Construction Bureau

THE JOB: Investigate, design and plan various engineering projects with minor supervision only, such as:

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Also, prepare working drawings and specifications for above projects; check drawings and specifications prepared by consulting engineers for projects similar to above; and serve as chief of party on topographic, boundary and construction surveys.

REQUIREMENTS: College degree with a major course of study in Civil Engineering; professional engineer's license State of New Jersey required; minimum of one year's experience.

Permanent Civil Service position with fringe benefits; salary open. Please send resume and salary requirements to:

Chief, Administrative Division
DEPARTMENT OF THE TREASURY
STATE HOUSE, TRENTON, NEW JERSEY

RESIDENT ENGINEER

For work in western New York State with consulting engineering firm on supervision of construction of bridge and highway work.
Previous experience as Resident Engineer on bridge and highway construction, and New York State P. E. license required.

SALARY OPEN
P-7483, Engineering News-Record
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

STRUCTURAL ENGINEERS

We now have immediate openings for graduate engineers with a minimum of three years design experience in heavy industrial construction, preferably in the ore handling and processing field. Salary is based on qualifications and experience. Send a complete resume, including education, experience and references to: PERSONNEL—

WESTERN KNAPP ENGINEERING CO.
650 Fifth Street, San Francisco, California

• *POSITIONS VACANT*

Estimator—Engineer, New York City area, B.S.C.E. reqd. Minimum five years exp. Familiar with roads, bridges, sewers, foundations and concrete structures. Must be able to take off, price and design formwork and temp. structures. Good pay. Permanent position. Write P-7479, Engineering News-Record.

Special Project Manager—To assume management and supervision of large, heavy construction project. Must be graduate engineer and capable of supervising engineering, purchasing, steel erection, concrete work, etc., and have exhibited ability and drive on other multi-million-dollar construction projects. Unless you are a graduate engineer and have had at least ten years' experience in heavy construction at management level, do not bother to answer this advertisement. P-7503, Engineering News-Record.

• *EMPLOYMENT SERVICES*

Hundreds of $7,000-$35,000 Executive jobs available. Write for free report. Strict confidence. National Employment Reports, 105 W. Adams, 830-B, Chicago 3.

• *POSITIONS WANTED*

Graduate Engr.—Age 33—10 years experience all phases of construction seeks challenging position in construction management with opportunity for advancement and growth. PW-7379, Engineering News-Record.

Geologist Engineering Miner—30, family, willing to relocate. Exp. in design and drafting of highways & bridges, subdivisions including calculating, san. sewer, profiles and water systems. Supervision of bridge, water well drilling and highway construction. PW-7356, Engineering News-Record.

Civil Engineer, 26, single—Exp. hwys, bridges & gen'l bldg. const., fluent French, overseas or anywhere. PW-7422, Engineering News-Record.

Executive: Experienced Genrl. Manager, hvy, bldg & mech const, Govt Contracts, Atty, Acct, Adm. employed. PW-7407, Engineering News-Record.

(Continued on opposite page)

• POSITIONS WANTED

(Continued from opposite page)

B.S.C.E., P.E., 33. 6 yrs. exp. sewers, hwys, insp. West, Southwest area. PW-7323, Engineering News-Record

Estimator, fifteen years experience, desiring connection with medium sized General Building Contractor to take full responsibility from bidding to completion, to handle buying, sub-contracts, change orders, shop drawing and progress flocharts. Prefer Southern states. PW-7410, Engineering News-Record.

Construction Engineer, B.C.E., 28, single. Six years petro-chem experience. Desires responsible supervisory position, foreign or domestic. PW-7442, Engineering News-Record.

Construction Project Manager, Superintendent or Consultant, with mechanical background. Age 49, available now. Desires connection with growing concern. Willing to relocate, travel, solve problems. Please explain offer in first letter. All replies acknowledged. PW-7443, Engineering News-Record.

Civil Engineer, registered, BSCE, 39—desire position as City Engineer or Director of Public Works. Presently Engineer in Public Works. Experience in highways, bridges, municipal works, land development and surveys. Resume on request. PW-7452, Engineering News-Record.

Registered Professional Engineer, Structural in Ohio. Civil in Michigan. Ten years in private practice architectural field designing and supervision of industrial and commercial building projects costing in excess of one million. Nine years as chief engineer for structural steel fabricating company, in charge of estimating, sales and engineering. Desires association with architectural, engineering, contracting or industrial concern, on salary or partnership basis. Will relocate. PW-7454, Engineering News-Record.

Construction Engineer Executive, age 44, excellent health, BSCE, registered engineer several states. Liquidating own eastern company. Operated 7 years, industrial-commercial projects, large national accounts; mostly negotiated contracts. Know all phases, top negotiator, and contract closer, can open any door. Salary not major consideration. PW-7336, Engineering News-Record.

Construction Supt. Heavy Construction. PW-4482, Engineering News-Record.

Project Manager, entire supervision & admin. estimating and methods, 24 yrs. exp. hvy-const. major projects U.S.&O.S. PW-7337, Engineering News-Record.

Construction Executive—30 years experience in all phases of heavy and industrial construction, power plants, chemical plants, sewage plants, filtration plants, refinery installations, locks, dams and tunnels. Interested in connection with aggressive contractor doing lump sum contracts and/or promotional sales work. Estimating and pricing accurate. Primary education M.E. Desirous of participating agreement. PW-7492, Engineering News-Record.

Project Manager—Age 40—18 years experience design, supervision of design, personnel relations, customer relations and management for all types of large industrial plants—Western area preferred. Salary $12,000 min. PW-7459, Engineering News-Record.

Structural Engineer and/or Plant Manager. P.E. prestressed & precast concrete experience. Desire position with growth potential. PW-7471, Engineering News-Record.

Supt. of Project Mgr:—BSCE Licensed Engineer, three states, 18 years Supt & Project Mgr, expressways, interstate roads, dams and bridge construction, bids thru to completion. Proven ability with excellent record, available at once. Prefer East of the Mississippi, will relocate. PW-7458, Engineering News-Record.

Construction and Engineering Manager, Reg. PE, 35 years diversified experience including foreign available for new challenging connection. PW-7491, Engineering News-Record.

Administrator—Accountant, capable of setting up foreign operations, w/experience from S.&C. America, fluent Spanish, seeks position w/contractor going south. PW-7488, Engineering News-Record.

• POSITIONS WANTED

Project Manager, N.Y. P.E., B.C.E., 35; 11 years responsible field and design experience. Want challenging position with high level responsibility. PW-7457, Engineering News-Record.

BSCE 5 yrs. municipal consulting, 6 yrs. County Hwy. Engineer, admin. & constr., 37. PW-7406, Engineering News-Record.

Senior Engineer, 35, graduate P.E. Structural and Civil with European background. 10 years extensive experience, large industrial, commercial and public projects, waterfront structures and bridges. West Coast or Europe preferred. PW-7460, Engineering News-Record.

Project Manager—Gen. Supt. Grad. Engr. B.S.C.E., Registered-go-getter. Desires connection, state side or overseas. Dams, oil refineries, bridges, tunnels, piers, mechanical installations — power plants — industrial plants—sewage treatment & water treatment plants—pile driving—coffer dams—good organizer—speak several languages—results. PW-7468, Engineering News-Record.

Project Manager—Gen. Supt. Grad. Engr., Registered B.S.C.E., Estimator. Desires connection Florida area. Bridges—dams—tunnels—sewage treatment & water treatment plants—docks—power plants. Housing projects, industrial plants—pile driving—piers—missile bases. 1508 Erin Lane, Clearwater, Fla.

Soils & Materials Engineer—31—family. 10 years soils, asphalt and concrete engineering; overseas and domestic. Experience dams, roads, airfields, foundations. Field and lab. testing and control. Foundation and material testing, exploration. Resume upon request. PW-7494, Engineering News-Record.

• POSITIONS WANTED

Yng Woman, Admin. Asst., Gal Fri. considerable exper. all phases genl constr. office. All office skills—knowl. of plans, specs, & expedtg. Background in purch. includ. very hvy contact w/subs & suppliers. Excelnt. knowl. subcontracts. Faml w/biddg procedures. requisitions & submission shop dwgs., etc. Prefer Metropolitan New York area. PW-7462, Engineering News-Record.

Project Manager, Contracts Administrator, Age 42, 20 years experience in engineering and contracts administration. Strong mechanical background, good knowledge civil. Mining, ore processing, steam power plants, papermills, refineries, petro-chemical plants, airbases, missile installations, heavy and general construction. Thoroughly competent in all phases of contracts administration and engineering office management. Previous foreign experience. Very good Spanish. Excellent references. Presently with engineering and consulting firm. Desire responsible administrative or managerial position. Prefer Europe or Latin America but will consider other locations. PW-7505, Engineering News-Record.

Const Equip Supt—Exp fleet dispatch, prev. maint., & rebuilding—also exp in excavation, sewer & water. PW-7506, Engineering News-Record.

Mature Administrator desires N.Y. City assignment. Many years all phases heavy and commercial construction. Ideal assistant to busy executive. PW-7507, Engineering News-Record.

Structural Eng., Stanford Grad., 11 yrs. exp. in bridges, bldgs., waterfront strs., hvy foundations, housing developments, fld. supervision desires resp. position in Calif. PW-7496, Engineering News-Record.

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W-7373, Engineering News-Record
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Niagara Power Project

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This material is located at the Niagara Power Project, Niagara Falls, New York, where it may be inspected by prospective bidders until Oct. 30, 1961.

Bidding documents containing terms of sale and description of the material offered, may be obtained upon application to Uhl, Hall & Rich, engineers for the Power Authority, P. O. Box 327, Niagara Falls, N. Y.

Bids will be received in writing only and must be received prior to 3:00 P.M., E.S.T., Nov. 15, 1961 in order to be considered.

The Power Authority reserves the right to reject any or all bids.

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Stiff leg Steel Derrick for Barge or Dock Mounting complete with Power

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250 Cubic Yard C. S. Johnson Fully Automatic—Fully Recording Complete with two (2) Koehring 4 c.y. Mixers, Conveyors, Tunnels, Rewash Screens, Etc.

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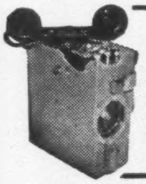

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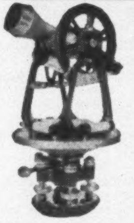

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Hurricane Lessons

The test Hurricane Carla gave engineering structures in her path was severe enough to warrant considerable satisfaction over the way the structures performed. The functioning of drainage facilities, on the other hand, was generally less than adequate. In both cases there are lessons for the future.

Seawalls, large buildings and all major bridges came through relatively unscathed. Many smaller structures, too, such as stores and houses, resisted the forces of the rain-carrying winds—if the devastating actions of local tornadoes are excepted. All this is gratifying because, so far as is known, nothing more than normal good practice in design and construction was followed.

The lesson, not to be obscured by good performance, however, is that normal good practice is by no means universal, nor is it necessarily good enough to cope with all hurricanes. Continuing improvement in design and construction is required to insure that structures are the safe havens in hurricanes that they should be.

Carla's biggest lesson, however, is related to hydrology. Few drainage or sewerage systems were able to cope with her onslaughts of water. Many communities experienced unprecedented intensities of rainfall, and some of them were far away from the Gulf Coast.

Carla demonstrated that a hurricane can carry almost undiminished amounts of water far inland, even while its wind velocities are dying down. The lesson is that rainfall intensity and runoff criteria used in the design of drainage structures need revaluation wherever hurricane effects are likely. Better drainage, like better structures, will contribute to safety in future hurricanes.

Headaches in Air Rights

No crystal ball is needed to predict that more and more buildings will be erected in the relatively near future over railroads and highways in downtown urban areas. Nor is one needed to foresee that as a consequence the problems of architects, engineers and contractors will multiply. For unusual building conditions usually are associated with such structures.

There appears to be an acceleration in the trend to use air rights over railroads and highways for buildings. The cause is partly the need of railroads for more income, partly rising real-estate values.

Many of the new buildings along New York City's Park Avenue, including the 60-story Pan Am Building, stand on land owned by the New York Central Railroad. Chicago developers have announced two major projects, involving buildings up to 52 stories high, on Illinois Central right-of-way. The cost may eventually total $500 million (ENR Sept. 14, p. 34).

Detroit's Cobo Hall straddles John Lodge Expressway for a distance of 850 ft. A public library in Hartford, Conn., bridges a depressed highway. Apartment houses will rise over the depressed approach highway to the George Washington Bridge in New York City. And in Portland, a four-story science building for the University of Oregon spans a street and a service alley as well as two other buildings.

Designers of these structures often find that they have to devise ways to carry heavy loads over unusually long spans. They also have to take special precautions to free the buildings of vibration from moving trains or automobiles. And they must insure adequate ventilation of the enclosed spaces.

Contractors, too, face especially difficult conditions. They usually have to sink the foundations with little or no interference to traffic. This may mean limiting work to specific, short day or night periods; placing concrete in tight, hazardous spaces; needling steel through narrow openings. And in the early stages of the job there may be no space available for storage of construction materials and equipment.

So while sellers and purchasers of air rights for building construction may make a mutually profitable deal, architects, engineers and contractors get an extraordinarily tough assignment. They should be prepared, for air-rights buildings are on the increase.

Just for the Elderly?

Housing the elderly is being stressed throughout the U.S. This is all to the good, for many older U.S. citizens have illnesses or other handicaps that require special conditions in housing for their safety and welfare. But are the houses being constructed for them actually giving them something that should not already be in everyone's house?

A good example is the public housing development, Van Dyke Houses II, for which plans have been filed by the New York City Housing Authority. All the apartments have been specially designed for the elderly, the NYCHA says. They include such features as nonskid tile floors in bathrooms, grab bars over bathtubs and toilets, low-hanging kitchen cabinets and gas ranges with automatic shut-off devices. Most of the apartments will have balconies.

The NYCHA will provide an outdoor area adjacent to the buildings for recreation and moderate exercise. And a community center will be located in a one-story wing. It will contain a large lounge, club room and kitchen.

No one can deny that these are features the elderly will appreciate. To them could be added a variety of other facilities such as an infirmary and conveniently located stores. But these are all items that every housing project, private or public, should provide. It would seem to be better economics to include such safety and recreational features in every project so that no housing need be completely restricted to special occupancy.

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"POWERSTEEL" in action for Wood & Busch near Georgetown, Ky.

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